

BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

)	
)	DOCKET NO. 10-035-124
In the Matter of the Application of Rocky)	
Mountain Power for Authority to)	Exhibit No. DPU 4.0
Increase its Retail Electric Utility Service)	
Rates in Utah and for Approval of Its)	Direct Testimony and Exhibits
Proposed Electric Service Schedules and)	
Electric Service Regulations.)	Charles E. Peterson
)	
)	

**FOR THE DIVISION OF PUBLIC UTILITIES
DEPARTMENT OF COMMERCE
STATE OF UTAH**

**Direct Testimony of
Charles E. Peterson**

May 11, 2011

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Testimony of Charles E. Peterson

I. INTRODUCTION AND SUMMARY

Q. Please state your name, business address and title.

A. My name is Charles E. Peterson; my business address is 160 East 300 South, Salt Lake City, Utah 84114; I am a Technical Consultant in the Utah Division of Public Utilities (Division, or DPU).

Q. On whose behalf are you testifying?

A. The Division.

Q. Please summarize your educational and professional experience.

A. I attended the University of Utah and earned a B.A. in mathematics in 1978 and a Master of Statistics (M.Stat.) through the Graduate School of Business in 1980. In 1990, I earned an M.S. in economics, also from the University of Utah.

Between 1980 and 1991, I worked as an economic and financial consultant and business appraiser for several local firms or local offices of national firms. My work frequently involved litigation support consulting and I have testified as an expert witness in both federal and state courts.

23 In 1991, I joined the Property Tax Division of the Utah State Tax Commission. In 1992, I
24 was promoted to manager over the Centrally Assessed Utility Valuation Section. I have
25 provided expert testimony regarding valuation, economic and cost of capital issues, both in
26 deposition and formal hearing before the Utah State Tax Commission.

27

28 I joined the Division in January 2005 as a Utility Analyst; in May 2006, I was promoted to
29 Technical Consultant. I have worked primarily in the energy section of the Division. In
30 2007, I earned the Certified Rate of Return Analyst (CRRRA) from the Society of Utility and
31 Regulatory Financial Analysts (SURFA).

32

33 My current resume is attached as DPU Exhibit 4.1.

34

35 **Q. Please outline the projects you have worked on since coming to the Division.**

36 A. I was involved in evaluating cost of capital issues in the 2004 rate case that was settled in
37 February 2005. In 2006 I provided written and oral testimony on cost of equity supporting
38 the stipulation that settled most issues in the PacifiCorp general rate case in Docket No. 06-
39 035-21. In May 2008 I provided written and oral testimony on cost of capital and related
40 issues in both the PacifiCorp and Questar Gas Company general rate cases (Docket Nos. 07-
41 035-93 and 07-057-13, respectively). In early 2009 I provided written testimony and oral
42 testimony in support of the stipulation on Cost of Capital in the PacifiCorp rate case Docket
43 No. 08-035-38. Subsequently I provided written testimony and oral cost of capital testimony
44 in the previous PacifiCorp general rate case Docket No. 09-035-23.

45

46 I have worked on DSM, HELP, and service quality and customer guarantees involving
47 PacifiCorp. I was the Division lead on an internal research project regarding ring-fencing that
48 resulted in a report to the Utah Public Service Commission (Commission). I have been the
49 lead on a number of QF contract cases. I was the lead of the economics and finance group
50 within the Division assigned to evaluate the proposed acquisition (Acquisition) of PacifiCorp
51 (Company) by MidAmerican Energy Holdings Company (MEHC). Please see Docket No.
52 05-035-54. I testified on behalf of the Division in PacifiCorp's purchase of the Chehalis
53 power plant on July 17, 2008 (see Docket No. 08-035-35). More recently, I was the
54 Division's primary witness in the ECAM docket (Docket No. 09-035-15) and the All Source
55 RFP docket (Docket No. 10-035-126).

56

57 **Q. What is the purpose of your testimony in this matter?**

58 A. My testimony discusses issues related to the cost of capital of the Company.¹ Cost of capital
59 includes capital structure, cost of common equity, cost of debt and cost of preferred stock.
60 Cost of equity and overall cost of capital are important parts of the revenue requirement of a
61 regulated utility. I provide testimony supporting the Division's position that currently the
62 appropriate cost of equity for PacifiCorp is 10.0 percent. The Division does not challenge at
63 this time the Company's requested returns on long-term debt and preferred stock, or its
64 requested capital structure.

65

¹ Rocky Mountain Power (RMP) is an operating division of PacifiCorp primarily performing the retail distribution operations of PacifiCorp in the eastern part (i.e. Utah, Wyoming and Idaho) of PacifiCorp's system. RMP runs no electric generators, and more importantly for my purposes, it has no debt, no preferred stock and no common stock. The fact that PacifiCorp files with the Commission under the name Rocky Mountain Power, doesn't change the fact that any cost of capital calculations are necessarily of the whole company (i.e. PacifiCorp) and not its local division. Therefore, throughout this testimony I will primarily refer to PacifiCorp, rather than RMP.

66 The Company's most recent long-term debt issuance was for \$1.0 billion in January 2009 at
67 an average cost of under 6.0 percent. The Company anticipates issuing \$400 million of
68 additional long-term debt in May 2011 and another \$600 million in January 2012. The
69 average forecast cost of this additional debt is approximately 5.71 percent,² during the test
70 period in this docket. The Division accepts PacifiCorp's proposed long-term cost of debt of
71 5.81 percent. The Division has no disagreement with the Company's preferred stock return of
72 5.43 percent.³

73

74 **Q. In a previous PacifiCorp rate case, you testified that you were asking the Commission**
75 **to modify its view of the use of different methodologies. What is your position on this**
76 **subject in this rate case?**

77 A. The Commission's decisions in Docket Nos. 07-035-93, 07-057-13 and 09-035-23 made
78 reference to different methodologies, but did not discuss the merits of the methodologies.⁴ In
79 this case I continue to use the same methodologies (cost of equity estimation techniques) as I
80 did in those dockets and in Docket No. 08-035-38.

81

82 **Q. Please briefly summarize the work and investigations that you have performed in this**
83 **matter.**

84 A. I have reviewed data and commentary on the economy generally. I have reviewed and
85 analyzed the testimonies of PacifiCorp witnesses Bruce N. Williams, the Company's

² Direct testimony of Bruce N. Williams, Exhibit RMP (BNW-4), page 2 of 4.

³ Direct testimony of Bruce N. Williams, page 2.

⁴ In particular, I advocated giving some credence to the Capital Asset Pricing Model (CAPM) due to its wide use and acceptance, while at the same time recognizing the difficulties previously discussed by the Commission in implementing this model in practice. I also suggested that the Commission may want to consider other models as they are from time to time offered and supported by testimony.

86 Treasurer, and Samuel C. Hadaway, Ph.D., an outside cost of equity witness. Mr. Williams
87 provided testimony regarding cost of debt, cost of preferred stock and capital structure. Dr.
88 Hadaway filed testimony on cost of equity. I have also performed my own independent
89 estimation of cost of capital, particularly with respect to cost of equity.

90

91 **Q. Please outline the scope of your testimony.**

92 A. First, I review the general economic situation in the United States. Second, I will review and
93 comment on the basis of the Company's capital structure request. Next I will review and
94 comment on the Company's requests for cost of preferred stock and long-term debt.

95

96 Then, I will describe the methods, data, and analyses that I used to arrive at the Division's
97 recommendation for cost of equity including the selection of comparable companies. Finally,
98 I will review and comment on those areas of Dr. Hadaway's testimony with which I agree
99 and disagree.

100

101 In order to prepare testimony, I set a cut-off of April 25, 2011 for stock prices, and the
102 weekly average debt yields for the last two weeks in April.

103

104 **Q. What is the Company's filed position regarding cost of capital?**

105 A. In its filing dated January 24, 2011, the Company asked for the following cost of capital rates
106 of return:⁵

107

108

⁵ Williams Direct testimony, January 2011, page 2.

109

110

	<u>Component</u>	<u>Structure</u>	<u>Cost</u>
112	Long-Term Debt	47.8%	5.81%
113	Preferred Stock	0.3%	5.41%
114	Common Stock	51.9%	10.50%
115	WACC	100.0%	8.25%

116

117 **Q. What have you concluded with respect to the Company's filed testimony?**

118 A. As outlined above, I concluded that the costs of the preferred stock and long-term debt are
 119 reasonable. I have also concluded that the requested capital structure is not unreasonable
 120 given the Company's on-going capital expenditure program. I believe that the cost of equity
 121 range estimate recommendation by Dr. Hadaway is on the high side. I believe the public
 122 interest would be better served if PacifiCorp's authorized cost of equity were set lower at
 123 10.0 percent.

124

125 DPU Exhibit 4.2 summarizes the capital structure and cost of capital point estimates
 126 supported by the Division. The final weighted average cost of capital is 7.98 percent. The
 127 following table summarizes the capital structure and cost of capital point estimates supported
 128 by the Division.

	<u>Component</u>	<u>Structure</u>	<u>Cost</u>
130	Long-Term Debt	47.8%	5.81%
131	Preferred Stock	0.3%	5.43%

132	Common Stock	51.9%	10.00%
133	WACC	100.00%	7.98%

134 **II. REVIEW OF THE CURRENT ECONOMY**

135

136 **A. The United States Economy**

137 **Q. Please briefly summarize the current state of the United States economy.**

138 A. The U.S. economy officially suffered through a recession between December 2007 and June
 139 2009.⁶ This recession was characterized by declining housing prices, mortgage foreclosures,
 140 rising unemployment, and, of course, nearly unprecedented turmoil in the financial markets.
 141 The severe difficulties in the banking systems have resulted in bankruptcies of financial
 142 companies and massive government intervention, both domestically and around the world in
 143 order to stave off the collapse of the financial system. This recession was probably the worst
 144 since the 1930s.⁷

145

146 Since the summer of 2009, the U.S. economy has been growing. The stock market is
 147 essentially up 100 percent since its March 2009 lows. Unemployment has declined, although
 148 not as much as hoped for, industrial capacity utilization has improved, and corporate profits
 149 are up from their recession lows which have been driving the stock market upward. In spite
 150 of the improvement in the economy since the end of the recession, economic growth has been
 151 somewhat sporadic with unemployment and housing being notable laggards. Indeed, the

⁶ National Bureau of Economic Research, Business Cycle Dating Committee, Report, September 10, 2010.
<http://www.nber.org/cycles/sept2010.html> Last accessed May 4, 2011.

⁷ The Value Line Investment Survey, "Economic and Stock Market Commentary," August 29, 2009.

Also see Bernanke, Ben S., "Reflections on a Year of Crisis" (Speech), Board of Governors of the Federal Reserve System, August 21, 2009.

(Footnote 9, continued) "This Downturn is Noticeably Different," by Mark Knold, Trendlines, Utah Department of Workforce Services, September/October 2009.

152 Federal Reserve's Open Market Committee (OMC) recently stated that "investment in
153 nonresidential structures is still weak, and the housing sector continues to be depressed."⁸
154 However, the OMC also noted "that the economic recovery is proceeding at a moderate pace
155 and overall conditions in the labor market are improving gradually."⁹
156
157 Value Line estimates that real U.S. gross domestic product (GDP) will increase by 3.1
158 percent in 2011 and 3.2 percent in 2012. Value Line forecasts inflation as measured by the
159 GDP price deflator to remain fairly subdued at about 1.8 percent over the next 3 to 5 years.¹⁰
160 Other forecasts of GDP include the Congressional Budget Office (CBO), which forecasts real
161 GDP to increase by 3.1 percent in 2011 and 2.8 percent in 2012.¹¹ The Energy Information
162 Administration (EIA) forecasts 2011 GDP to grow 2.2 percent and 3.9 percent in 2012.¹²
163 Despite the somewhat disparate forecasts, the important point to note is that these forecasts
164 all suggest moderate growth for the United States economy.

165

166 **Q. Are there economists and other experts forecasting a return of the recession coupled**
167 **with high interest rates and commodity prices?**

168 A. Yes. Some economists and market pundits have considerable concern that the high levels of
169 U.S. government debt coupled with strapped state budgets will be a drag on the economy that
170 will result in slower growth and even another recession when the Federal Reserve's (Fed) so-
171 called Quantitative Easing 2 ends in June. Quantitative Easing 2 is the Fed program to put

⁸ Federal Reserve "Press Release," April 27, 2011.
<http://www.federalreserve.gov/newsevents/press/monetary/20110427a.htm> Accessed May 4, 2011.

⁹ Ibid.

¹⁰ Value Line Investment Survey, Economic Series, April 29, 2011.

¹¹ CBO, Economic Projections, Table 2.1, January 2011.

¹² Energy Information Administration (EIA), "Annual Energy Outlook 2011," DOE/EIA-0383(2011), Release Date: April 26, 2011.

172 money into the economy through the market purchase of U.S. Treasury securities. It is feared
173 that when this support is lifted interest rates will rise, slowing economic activity. High
174 commodity prices, such as oil, are affected more by international events than by what
175 happens in the United States. These commodity prices may not come down much even with a
176 slowing U.S. economy and little wage growth, perhaps starting a period of “stagflation.”¹³

177

178 **Q. What does this mean for PacifiCorp?**

179 A. It likely means that electric load growth for PacifiCorp will remain sluggish, that is below
180 trend, for a few more quarters. Of course, if things worsen, then loads could decline. For
181 now, though, PacifiCorp has been experiencing growing revenues and load demand over the
182 last year or so.¹⁴

183

184 **Q. What opportunities might this slower growth create for the Company?**

185 A. One opportunity is that the Company might be able to slow its capital spending for a few
186 quarters, thus reducing interest expense and the need for further debt financing.

187

188 **B. The US Stock Market**

189 **Q. What has happened in the stock market since last year?**

190 The financial markets are generally supporting the view that the economy is expected to
191 continue to grow. The market indices have risen approximately 100 percent from their March

¹³ See for, example, the following recent articles last accessed May 10, 2011:

<http://finance.fortune.cnn.com/2011/03/04/global-stagflation-is-here-to-stay/>

<http://dailycaller.com/2011/04/29/stagflation-is-here-declares-cnbc-larry-kudlow/>

¹⁴ Energy Information Administration (EIA), Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions."

192

193 2009 lows to date. The upward trend has continued with the Standard & Poor's 500 Index
194 increasing over 7.0 percent so far in 2011, not including returns from dividends.

195

196 **Q. What effect does a rising stock market have on cost of capital calculations?**

197 A. Everything else equal, rising stock prices are an indication that investors view future risks as
198 diminishing, in other words, that the cost of equity is declining.

199

200 **Q. So, from general stock market conditions you would expect cost of equity to be lower
201 now than a year ago.**

202 A. Generally, yes. Of course, with specific companies and specific industries this may not be
203 true, so one must look at the specific data for a company or industry.

204

205 **C. The U.S. Bond Market**

206 **Q. How would you characterize the bond markets?**

207 A. Over the past year, or so, the bond markets appear to have behaved more or less normally.

208

209 **Q. Do interest rates generally support this view?**

210 A. Yes. DPU Exhibits 4.14 sets forth data from the Federal Reserve comparing Aaa and Baa
211 corporate bond rates. These data show the rates and the spreads have returned to their levels
212 prior to the 2008-2009 financial crisis. In absolute terms, the Baa bond rates are now below
213 their levels in 2006 and 2007. Similarly, Aaa bonds are essentially trading at, or slightly
214 below their yields before the financial crisis. Federal Reserve Chairman Ben Bernanke

215 recently commented that “corporate bond issuance has been strong”¹⁵ which also suggests
216 that the markets for long-term corporate debt are functioning fairly normally.

217
218 Short-term rates likewise show improvement as set forth on DPU Exhibit 4.16 that compares
219 90-day T-Bill rates with 90-day LIBOR (London Inter-Bank Offer Rate) rates. The Exhibit
220 shows that rates and spreads are more favorable now than they were during the peak of the
221 financial crisis. The lower rates and the narrower spreads are indicative of improved liquidity
222 and market conditions.

223

224 **Q. What are your conclusions concerning the financial markets?**

225 A. The financial markets appear to have largely returned to their pre-crisis operations. The
226 stock market in particular has retraced a significant amount of its loss over the past two years
227 and long-term interest rates are now similar to what they were prior to the crisis. I conclude
228 that at this point the financial markets are fairly stable and functioning.

229

230 **D. Summary of the Utah Economy**

231 **Q. Has Utah’s economy been affected by the downturn in the U.S. economy?**

232 A. Yes. Although as pointed out by the Utah Governor’s Office of Planning and Budget
233 (GOPB), “Utah fared better than the nation during the recession, and is poised to lead the
234 U.S. into the recovery.”¹⁶

235

236

¹⁵ Ibid.

¹⁶ GOPB, “Economic Outlook 2011,” page 5.

237 **Q. What is the current economic situation in Utah?**

238 A. As of February 2011 Utah's unemployment rate was 7.7 percent compared to the national
239 unemployment rate of 8.9 percent. Growth in employment in Utah was running at about 1.6
240 percent annually versus 1.0 percent for the nation as a whole.¹⁷ However, wages and personal
241 income, while growing, were lagging somewhat behind the national averages through the end
242 of 2010. Personal income in Utah grew at an annual rate of 3.4 percent compared to 3.9
243 percent in the nation; wages in Utah grew at a 1.6 percent rate and were forecast to grow 2.1
244 percent in 2011. In the nation, wages are forecast to grow 3.3 percent in 2011.¹⁸

245

246 **Q. What is the outlook for Utah?**

247 A. **Economic growth in Utah is expected to accelerate during 2011. Employment is**
248 **forecast to increase 1.4% for the year as a whole, with larger increases as the**
249 **year progresses. Construction employment is forecast to increase 3.3%, the first**
250 **year of growth following three years of contraction. Housing permits are**
251 **forecast to move up slightly from historic lows. As the overall unemployment**
252 **rate declines to 7.1%, the improving labor market will support increased**
253 **consumer spending and a broad based recovery.**¹⁹
254

255 As cited above, there is an expectation that growth will continue in Utah and the rest of the
256 nation.

257

258 **Q. Given the current economic situation, what are some of the ramifications for**
259 **PacifiCorp?**

260 A. As mentioned above, PacifiCorp may be able to reasonably delay some capital spending and
261 thus avoid some debt costs. A relatively slow-growth economy suggests that demand for

¹⁷ Utah Department of Workforce Services, Press Release, March 17, 2011.

¹⁸ GOPB, "Economic Summary," April 2011.

¹⁹ Ibid.

262 electricity in PacifiCorp's service territory, including Utah, will likely also be slow-growth
263 over the next few quarters. Longer term, there is reason to expect that PacifiCorp will
264 participate in the return to more normal economic growth.

265

266

267

III. CAPITAL STRUCTURE

268

269 **Q. What is PacifiCorp's current capital structure?**

270 A. I examined the latest actual capital structure of the Company that was available from the
271 Company's SEC Form 10-K as of December 31, 2010. As of December 31, 2010, the capital
272 structure was 53.0 percent common equity, 46.7 percent long-term debt and 0.3 percent
273 preferred stock. Subsequent to the end of 2010, the Company paid dividends in February and
274 April 2011 to its parent company totaling \$550 million. These dividend payments, combined
275 with the issuance of long-term debt in May 2011, mentioned earlier, will have the effect of
276 reducing the common equity ratio. The Company has indicated it intends to pay dividends in
277 2012 as well.

278

279 **Q. What are the capital structures of the comparable, or guideline, companies you used in
280 your analysis? ²⁰**

281 A. DPU Exhibit 4.16 sets forth calculated capital structures for common equity for the
282 comparable companies I used. It shows that as of December 31, 2010, none of the guideline

283

²⁰ The selection of the comparable companies will be described in detail in the cost of equity section of my testimony.

284 companies had common equity percentages above 50 percent. The average equity percentage
285 is about 46.5 percent — 6.5 percentage points below PacifiCorp's.

286

287 **Q. Dr. Hadaway uses some companies as comparables that you did not use. Do Dr.**

288 **Hadaway's comparable companies support an equity percentage above 50 percent?**

289 A. According to the March 2011 AUS Monthly Report, two of Dr. Hadaway's guideline
290 companies, ALLETE and Duke Energy, had common equity ratios of 55 and 54 percent,
291 respectively. The remaining companies appear to have common equity ratios typically in the
292 mid-40 percent range, similar to my guideline companies. I did not include ALLETE in my
293 list of guideline companies because of its small size relative to PacifiCorp. I did not include
294 Duke Energy this year because it is in the process of acquiring Progress Energy.²¹

295

296 **Q. What are the effects of PacifiCorp having a stronger balance sheet, as represented by**
297 **its higher equity percentage, than the average of your comparable companies?**

298 A. Having a stronger balance sheet helps PacifiCorp maintain its Standard & Poor's A bond
299 rating, which in turn helps the Company to obtain debt financing at relatively favorable
300 interest rates. On the negative side, increasing the common equity percentage increases costs
301 to the Company's ratepayers, all other things held equal.

302

303 **Q. What common equity percentage in the capital structure are you recommending?**

304 A. I am not disputing the Company's requested capital structure at this time. The Company is in
305 a build cycle and arguably is viewed more favorably on Wall Street because of its relatively
306 strong capital structure. This helps the Company to finance its projects more readily at

²¹ I included both Duke and Progress in my list of guideline companies in Docket No. 09-035-23.

307 favorable costs. As pointed out by Mr. Williams in his direct testimony, the Company's
308 requested capital structure is similar to its requests in recent years.²² Mr. Williams also states
309 that the long-term capital structure should approximate 50 percent common equity.²³ At this
310 point I have no strong basis to try to "fine tune" the capital structure.

311

312

313

IV. COST OF DEBT AND PREFERRED STOCK

314

315 **Q. What did you do with respect to the cost of preferred stock?**

316 A. I studied the testimony of Company witness Bruce Williams and the related exhibits. Mr.
317 Williams requested the cost of preferred stock be set at 5.43 percent. The 5.43 percent figure
318 is the imbedded cost of preferred stock. PacifiCorp has not issued new preferred stock in
319 several years and has, in fact, retired most of the preferred stock it had outstanding ten years
320 ago. The Company has not indicated any intention of issuing new preferred stock in the
321 future. I recommend accepting the Company's cost of preferred stock rate of 5.43 percent.

322

323 **Q. Do you have any issues with the Company's long-term debt rate?**

324 A. As stated above, Mr. Williams' direct testimony indicates that the Company intends to issue
325 \$400 million in long-term debt in May 2011. The expected rate for this debt is 5.65 percent.
326 In January 2012 the Company anticipates issuing \$600 million in long-term debt at an
327 estimated rate of 5.823 percent. The estimated overall debt rate of 5.81 percent appears

328

²² Williams, Op. Cit., page 13.

²³ Williams, Ibid., page 3

329 reasonable. Therefore, the Division does not dispute the *pro forma* embedded cost of debt of
330 5.81 percent.

331

332 **Q. Do you have any further comments regarding Mr. Williams' testimony?**

333 A. No.

334

335

336 **V. COST OF COMMON EQUITY**

337

338 **A. SUMMARY AND CONCLUSIONS**

339 **Q. Please summarize your cost of equity calculations and conclusion.**

340 A. First I identified comparable (proxy or guideline) companies that I would use to estimate the
341 cost of equity for PacifiCorp. These comparable companies are summarized in DPU Exhibit
342 4.4. I will explain the selection process for the comparable companies later in my testimony.

343

344 Then, using data from public sources related to the comparable companies, I calculated
345 several variations of the standard single-stage discounted cash flow (DCF) model and the
346 two-stage DCF model. In calculating these models, I used the average closing price covering
347 30 trading days ending April 25, 2011.²⁴ I considered several variations of the capital asset
348 pricing model (CAPM) using different historical periods to estimate the market risk
349 premium, different sources of beta, and the 20-year U.S. Treasury bond and the 90-day U.S.
350 Treasury bill rates as estimates of the risk-free rate.

²⁴ In previous dockets I have also used a "spot" price for each guideline company. However, I have concluded that the spot price analyses in previous dockets added little to the discussion, and would not have made a significant contribution in this Docket. Therefore, I have not included spot price analyses.

351

352 Finally, similar to what I did in my previous testimony in Docket Nos. 07-035-93, 08-035-38,
353 and 09-035-23, I constructed estimates using a risk-premium model based upon Value Line
354 financial strength ratings.

355

356 DPU Exhibit 4.3 sets forth a detailed summary of the results of the models and calculations
357 that I considered relevant to determining the cost of equity for PacifiCorp. DPU Exhibit 4.3
358 sets forth my final recommendation, which is a point estimate of 10.0 percent as the cost of
359 common equity applicable to PacifiCorp at this point in time. I would consider a reasonable
360 range to be between 9.85 percent and 10.15 percent.

361

362 **B. AN OVERVIEW OF COST OF COMMON EQUITY MODELS**

363 **Q. What methods did you look at in order to estimate the current market cost of equity for**
364 **PacifiCorp?**

365 A. I used standard discounted cash flow models (DCF) coupled with two types of risk premium
366 models to support and complement the DCF analyses. Regarding the DCF models, I
367 considered both the simple or single stage model and two-stage DCF models. Within each
368 model, I considered variations of different growth rates.

369

370 Risk premium models included the CAPM and a model I developed at the Utah State Tax
371 Commission and included in previous testimony before this Commission that uses factors
372 based upon Value Line financial strength ratings to adjust the expected market return for
373 varying risk.

374

375 **Q. Please briefly describe the Single-Stage DCF model.**

376 A. The single-stage DCF model is based upon the assumption that the value of ownership in a
377 common stock is based upon the returns the stockholder expects to receive into perpetuity. It
378 incorporates the current dividend and the prospects for growth in that dividend over time.
379 Among other things, the model assumes that the expected price-to-earnings ratio for the
380 company's stock will remain constant at the current level. In the single-stage model it is
381 assumed that there exists a growth rate "g" that is constant; that is, this "g" will adequately
382 serve as a surrogate for the growth in dividends for all periods of time in the future. The
383 formula used is:

$$384 \quad k_e = D_0 \cdot (1+g) / P_0 + g$$

385 Where: k_e is the cost of common equity
386 D_0 is the current dividend
387 P_0 is the current stock price
388 g is the (constant) growth rate
389
390

391 **Q. Please describe Two-Stage DCF models.**

392 A. Two-stage DCF models are based upon the same principles and assumptions that the single-
393 stage models are based upon except that for an initial period of years, usually five to ten
394 years, the dividends are explicitly forecast. Following this initial period, a "terminal value" or
395 lump-sum price is calculated which represents the estimated present value of the future
396 dividends following the initial period. A discount rate is found for the explicitly forecast
397 initial period dividends and the terminal value such that the present value of the forecast
398 dividends and terminal value equals the current stock price. This discount rate is the cost of
399 equity in the two-stage DCF model.

400

401 The justification of using a two-stage model is that the analyst has disaggregated the future
402 period into two distinct parts and wants to explicitly model the different parts. Usually, the
403 analyst has two growth rate forecasts that he wants to show separately, one growth rate for
404 the initial period, and a different terminal or perpetuity growth rate. Rarely, the analyst may
405 also want to show different discount rates for the initial and terminal periods. The concepts
406 of a two-stage model are sometimes extended to a three-stage (i.e. two “initial” periods
407 followed by a terminal period) or even more.

408

409 Any multi-stage DCF model can be reduced to a single stage equivalent. Consequently, it
410 makes no sense to use a two or more-stage model if the growth rates in the different periods
411 are the same, since that would be equivalent to a single-stage model with that growth rate.

412

413 **Q. What are the strengths and weaknesses of the DCF models?**

414 A. Briefly, the strengths of the models are their simplicity and ease of application, particularly in
415 the single-stage version of the model. DCF models are derived directly from the financial
416 theory that the price of a common stock is equal to the present value of the future cash flow
417 available to stockholders. Two of the three principal components of the model are directly
418 observable in the market: the dividend and the stock price. The future growth rate is
419 necessarily an estimate, and thus can be controversial. The single-stage model can be faulted
420 for the assumption that there is a single growth rate that will apply to the company into the
421 indefinite future (theoretically, forever). As discussed above, non-constant and multi-stage
422 DCF models can handle changing growth rates in the future and even changing discount

423 rates, but they are increasingly complex and usually require the analyst to make many
424 subjective judgments.

425

426 **Q. As you cited earlier, the Commission in the 2002 Questar Gas Company general rate**
427 **case adopted a formula using a 75 percent weighting on earnings growth estimates and**
428 **a 25 percent weighting on dividend growth estimates. Do you have any comments on**
429 **this weighting scheme?**

430 A. For a single-stage model, this weighting appears reasonable to me. It gives consideration to
431 the fact that the model is theoretically about dividends and not earnings, but also reflects that
432 dividend growth is related to earnings growth. Implicit as well is the concept that differences
433 between dividend growth and earnings growth rates in the near-term have a greater effect on
434 the cost of equity than any such differentials in the far future. Therefore, I find that this
435 weighting scheme is reasonable and I use it as part of my analysis.

436

437 **Q. Do you have any further comments comparing Single-Stage DCF models with Two-**
438 **Stage models?**

439 A. Yes. The main advantage of two-stage (and even three-stage, or more) models is simply the
440 ability to separate out the estimate into two or more components. If the analyst has a good
441 basis for the specific separation of future cash flows into two or more components and has a
442 good basis for the length of time of the initial stage(s) as well as the growth differentials for
443 different components, then these models can be useful. They would also be useful if the goal
444 were to develop “what if” scenarios. However, in the case of cost of equity estimates, even
445 for a company in a mature industry, the time periods used and the growth rate differentials

446 tend to be subjective and even arbitrary. The analyst has to make more judgments and
447 assumptions including the length of the periods of different growth rates, the growth rates for
448 different periods, the calculation of the terminal value (if any), and whether, or not, to
449 assume the discount rate should remain constant and if not, how is it going to be estimated.
450 Given these complexities with two-stage or higher multi-stage DCF models, they are unlikely
451 to be much better estimators of cost of capital unless the analyst has a solid basis for the
452 different growth estimates.

453

454 As describe above, the results of a two- or more- stage DCF model have a single-stage
455 equivalent growth rate that may not be much different from the growth rates used in a multi-
456 stage model in a mature and price-regulated industry such as the electric utility industry.
457 This is especially true if the long-term growth rates are expected to be approximately the
458 same as short-term rates. However, if long-term growth rates are expected to be different
459 from the short-term rates, then a multi-stage model is more appropriate.

460

461 **Q. Please briefly describe the CAPM model.**

462 A. The CAPM is a type of risk premium model. CAPM grew out of theoretical work in modern
463 portfolio theory in the 1960s. Modern portfolio theory had shown that diversified portfolios
464 could reduce the variability in the value of those portfolios and that a risk factor called “beta”
465 could be used to estimate the relative variability of a portfolio to the market portfolio. The
466 theory of CAPM is that the cost of equity is equal to the risk free rate plus a market risk
467 premium adjusted by the risk factor beta. The market risk premium is the additional return
468 over the risk free rate that a portfolio of all risky investments, i.e. the “market,” would expect

469 to earn. One of the theoretical underpinnings of CAPM is that through a diversified portfolio
470 investors could virtually eliminate risk specific to a particular investment such that if the
471 investor were sufficiently diversified, he would only face the risk of the market, which is also
472 called systematic risk. Beta is a measure of the volatility of an investment's value compared
473 to the market as a whole and will indicate to an investor how a given investment will affect
474 the systematic risk of his portfolio.

475

476 Under CAPM theory investors are not rewarded for the specific risks of a particular
477 investment because these risks can be diversified away. The only reward the investor
478 receives is the systematic risk, represented by the beta that an investment brings with it to the
479 portfolio.

480

481 The calculation of the CAPM cost of equity for a company is straightforward and is based
482 upon readily available information. This model is widely taught in the academic literature
483 and is widely used in industry.²⁵

484

485 The formula for the CAPM is as follows:

$$486 \quad k_e = RFR_0 + \beta * (MR-RFR)$$

487 Where: k_e is the cost of common equity
488 RFR_0 is the current risk free rate
489 β is beta, the risk adjustment factor

²⁵ Modern portfolio theory and the capital asset pricing model are discussed in detail in texts on corporate finance and investment valuation. See, for example:

Brealey, Richard A., Stewart C Myers and Franklin Allen. (2006). *Principles of Corporate Finance 8th ed.* New York: McGraw-Hill Irwin.

Brigham, Eugene F. and Joel F. Houston. (2007). *Fundamentals of Financial Management 5th ed.* Mason, Ohio: Thomson South-Western.

Damodaran, Aswarh. (2002). *Investment Valuation.* New York: John Wiley & Sons, Inc.

Parcell, David C. (1997). *The Cost of Capital – A Practitioners Guide.*

490 (MR-RFR) is the market risk premium, which can be decomposed
491 into two factors: the overall market return, MR, and the
492 RFR that is consistent with the way the MR was
493 estimated.
494

495 **Q. Please briefly discuss some of the strengths and weaknesses of the CAPM.**

496 A. The strengths include a firm theoretical basis for the model, its relative simplicity and
497 intuitive appeal. The model is widely taught and apparently widely used in corporate
498 America. The downside of the model is that there is little consensus on how each of the
499 factors are developed and the model implemented.

500

501 Different analysts will choose different risk free rates, which will affect the outcome, as I
502 demonstrate in my application. Academics sometimes favor using a Treasury Bill rate as the
503 most nearly true risk free security, while practitioners (including this one) favor longer-term
504 bond rates to match the apparent holding period of the asset. Beta is calculated in various
505 ways using different base periods, market proxies and other measurement differences such as
506 the frequency of the observations and even the day of the week the observations are made.
507 Some services offer “adjusted” betas that “correct” the calculated or “raw” beta to account
508 for the apparent tendency of betas to revert to a mean over time. The available services
509 assume that the mean that the betas revert to is the market beta, 1.0.

510

511 There is evidence that utility company betas should not be assumed to revert to a mean of
512 1.0. Gombola and Kahl studied 109 utilities and found that the mean that their betas reverted
513 to was 0.52. (Gombola, Michael J., and Douglas R. Kahl, “Time-Series Processes of Utility
514 Betas: Implications for Forecasting Systematic Risk,” Financial Management, Autumn 1990,

515 pp. 84-93). A more recent study by Buckland and Fraser of British water utilities found a
516 mean of about 0.7. However, this study is less compelling due to its limited scope and
517 geographic location (Buckland, Roger and Patricia Fraser, “Political and Regulatory Risk in
518 Water Utilities: Beta Sensitivity in the United Kingdom,” *Journal of Business Finance &
519 Accounting*, 28(7) & (8), September/October 2001, pp. 877-904.) In my analyses I use
520 Value Line betas²⁶ and betas from other sources.

521

522 Perhaps the most hotly debated factor is the market risk premium, also called the equity risk
523 premium; that is, the premium return investors demand from stocks over the risk free rate.

524 Some practitioners support the use of the arithmetic average of the difference between
525 historical stock market returns (with the Standard & Poor’s 500 Index as a proxy) and long-
526 term (approximately 20 years) treasury bond returns since 1926 as popularized by Ibbotson
527 Associates over the last 30 years or so.²⁷ However this approach has been criticized by
528 academics and others on a number of grounds. Some say the historical time period is too
529 long, reaching back to a much different economy than we have today. Others have cited
530 technical problems with the data Ibbotson compiled. One technical problem is referred to as
531 “survivor bias.” Survivor bias refers to the fact that the underlying Ibbotson data are
532 composed of companies that were successful; losers are not included. Studies indicate that
533 this bias inflates the Ibbotson-based market risk premiums by about 1 to 2 percentage
534 points.²⁸ For these reasons, I generally prefer to examine a 30 to 50 year time period. Thirty

²⁶ Value Line adjusts its betas for mean reversion. The formula is $\beta_a = \beta_r \times .65 + .35$, where β_a is the Value Line adjusted beta and β_r is the raw beta. Applying this formula to the 0.67 mean Value Line beta found in DPU Exhibit 1.10 results in a raw beta estimate of 0.49, which is similar to the estimated mean found in the Gombola and Kahl study. It is also similar to the mean of the non-Value Line beta estimates of 0.50.

²⁷ *Stocks, Bonds, Bills, and Inflation (SBBI)*, any edition, published annually by Ibbotson Associates (now a division of Morningstar).

²⁸ Brigham and Houston, *supra*, p. 272.

535 to 50 years is long enough to smooth out most of the annual fluctuation and mitigate many of
536 the criticisms leveled at the Ibbotson historical period.

537

538 Another issue is the use of arithmetic averages versus geometric averages.²⁹ Ibbotson
539 Associates, Brealey, Myers, and Allen among others, argue that arithmetic averages produce
540 the appropriate unbiased estimates of returns. Usually a decision tree-type analysis covering
541 one or two years is produced showing how this would work. However, the use of arithmetic
542 averages significantly overstates the actual returns an investor would have actually received
543 over a long historical period of time, a time period in which the geometric average much
544 more accurately reflects the actual experiences of investors. Indro and Lee demonstrated that
545 both the arithmetic and geometric returns are biased estimates of investor returns over more
546 than one period of time (they used months as their units of time), but that for longer periods
547 of time, the geometric return becomes the better estimator. For one period forward the
548 arithmetic average is an unbiased estimator of investor returns (the geometric is biased for
549 one period as well), but if the returns are to be calculated for longer terms, the geometric
550 return becomes better. Indro and Lee advocate using a weighted average between arithmetic
551 and geometric returns for terms of more than one period.³⁰ For these reasons and others,
552 some experts advocate geometric returns.³¹ In short, there is great dispute about how the

²⁹ "Arithmetic" averages are simply averaging the annual changes over a time period without accounting for any compounding effects. "Geometric" averages account for compounding effects and answer the question of "what was my average annual compounded return over a given period."

³⁰ Indro, Daniel C. and Wayne Y. Lee, "Biases in Arithmetic and Geometric Averages as Estimates of Long-Run Expected Returns and Risk Premia," *Financial Management*, Vol. 26, No. 4, Winter 1997, pages 81-90.

³¹ For a discussion of geometric versus arithmetic averages, see Damodaran, *Op. Cit.* pages 161-162.

PPC's Guide to Business Valuations, Volume 1, paragraph 502.8, Practitioners Publishing Company, Fort Worth Texas, February 2006. Also see Damodaran, Aswath, "Equity Risk Premiums (ERP): Determinants, Estimation and Implications, The 2011 Edition" <http://pages.stern.nyu.edu/~adamodar/>, see recently published articles. Accessed May 4, 2011.

553 market risk premium should be estimated.

554

555 I have used the Ibbotson Associates data because they are readily available and widely used.

556 The errors that are known, primarily the survivorship bias, can be corrected for or otherwise

557 taken into account. A distinction must be made between the Ibbotson data and the “Ibbotson

558 method.” The “Ibbotson method” primarily refers to using an arithmetic average of the entire

559 historical period since 1926, without any adjustment, to calculate the market risk premium. It

560 is this “Ibbotson method” in particular that I disagree with.

561

562 Empirical studies of stock returns have turned up anomalies that have suggested flaws in the

563 CAPM. In order to correct for these anomalies (and save the basic theoretical construction)

564 additional factors have been specified for the model such as the Fama-French three-factor

565 model or add-ons to the model such as adjustments for size or industry. None of these

566 adjustments have avoided controversy.

567

568 The practical implementation of the model has resulted in much controversy and

569 consternation. Despite these problems the CAPM is widely used in academic literature, by

570 corporate chief financial officers and Wall Street analysts, and has an established theoretical

571 basis. These facts necessitate that an analyst at least consider the CAPM in evaluating a cost

572 of equity problem.

573

574

575

576 **Q. Please briefly describe the model based upon Value Line financial strength ratings.**

577 A. This model begins with an estimate of the expected market return on common stock derived
 578 in the same manner as with the CAPM. The expected return for the entire market is then
 579 adjusted by a risk factor based upon the average Value Line financial strength rating for the
 580 comparable companies. Using the entire Value Line data set, a regression equation is
 581 matched to the average forecast total returns by financial strength rating class; this equation
 582 is constructed, in part, to estimate the returns between whole ratings. Starting with a
 583 weighted average rating for the entire Value Line universe of companies, a ratio of the
 584 expected returns to this average return is constructed. This ratio becomes the “risk factor”
 585 that adjusts the expected market return. Algebraically the formula is:

$$586 \quad k_e = f * MR = f * (MRP + RFR)$$

587 Where: k_e is the cost of common equity
 588 RFR is the risk free rate
 589 MR is the expected market return
 590 MRP is the market risk premium
 591 f is the risk adjustment factor
 592
 593

594 Generally, the higher the rating (i.e., the lower the risks as measured by that rating), the
 595 lower the expected return. Thus, higher ratings than the weighted average will result in a risk
 596 factor less than one; the highest financial strength rating should have the lowest risk factor,
 597 and vice versa. This all comports with current financial theory: the higher the risk, the higher
 598 the expected return; the lower the risk, the lower the return.

599

600

601

602

603 **Q. Where has this model been used?**

604 A. I used this model as a secondary estimate of cost of equity at the Utah State Tax Commission
605 for about ten years.³² Its use has been included in contested cases heard by the Tax
606 Commission where other parties' experts had the opportunity to review and comment on it
607 and I was subject to cross-examination.

608

609 **Q. Do you expect the Utah Public Service Commission to rely on this model now, or in the**
610 **future?**

611 A. Not necessarily. I offer it because I personally use it and compare it with other estimates.

612

613 **Q. What are the strengths and weaknesses of the "Value Line Financial Strength" model?**

614 A. The model is an alternative risk premium model that uses a factor based upon Value Line's
615 widely known financial strength rating to adjust the expected market return. The market
616 return is derived in the same way as the CAPM market return is estimated, so this provides
617 an accepted starting point for the method. The risk factor is then empirically calculated based
618 upon the industry financial strength rating (as represented by the comparable companies).
619 Over several years the model has yielded reasonable results.

620

621 The weaknesses include the reliance on Value Line as the source of the financial strength
622 ratings and the relative forecast returns of the individual companies. The risks of a particular
623 industry, e.g. the electric utility industry, may differ from companies in the Value Line
624 universe generally even though they share the same financial strength rating. Finally, the
625 model has not been published and consequently is not widely known or tested.

³² By Tax Commission rule, the primary cost of equity model is a variation of CAPM.

626 **C. COMPARABLE (PROXY) COMPANIES**

627 **Q. What are the “comparable companies” you referred to and how were they chosen?**

628 A. One of the first steps in the estimate of cost of equity is the selection of publicly traded
629 “comparable” companies (also referred to as “guideline” companies and proxy companies)
630 whose market returns and characteristics are studied in order to infer from them what the
631 appropriate cost of equity should be for PacifiCorp. The selection and use of comparable
632 companies is obviously critical since PacifiCorp itself is not an independent, publicly traded
633 company. However, even if PacifiCorp were publicly traded it would be advisable to
634 compare it with closely related companies in its industry. The Company’s witness, Dr.
635 Hadaway, chose 20 companies as cited in his testimony. I made a selection of 9 companies,
636 all of which are included in Dr. Hadaway’s list. The criteria I used to select comparable
637 companies included (1) similar bond ratings to PacifiCorp; (2) similar size to PacifiCorp; (3)
638 significant owned generation capacity including some thermal generation,³³ (4) at least 70
639 percent of revenue and/or income derived from regulated electric utility operations, or
640 alternatively at least 50 percent from regulated electric utility operations and the sum of
641 regulated electric and regulated gas utility operations is over 80 percent; and (5) “Other.”
642
643 More specifically, I chose companies whose bond ratings ranged from BBB+ to AA-
644 (Moody’s Baa1 to Aa3) from at least one of the rating agencies, Standard & Poor’s or
645 Moody’s. This range is based upon PacifiCorp’s bond rating of A as part of MEHC and
646 BBB+ as a free-standing firm. For size, the company’s annual revenues had to be between
647 \$1.5 and \$20 billion, and net plant in service had to be between \$5.0 billion and \$49 billion.

³³ In the past I have been stricter on this criterion; however, with several potential proxy companies engaged in merger and acquisition activity, and therefore excluded, I found it necessary to relax this criterion in order to present a reasonable number of guideline companies.

648

649 DPU Exhibit 4.4 lists my selection of comparable companies along with summary data
650 supporting their selection. I will discuss the issues I have with the additional companies Dr.
651 Hadaway uses later in my discussion of Dr. Hadaway's analysis.

652

653 **Q. Did you perform any other analyses that show that the companies you selected are**
654 **generally comparable to PacifiCorp?**

655 A. Yes. DPU Exhibit 4.16 was created to compare PacifiCorp with my list of comparable
656 companies using ratio and other financial measures. For a number of these measures
657 PacifiCorp is fairly typical of the comparable companies. However, the Company is
658 consistently average or below average in return on equity and return on assets and in
659 revenues per fixed assets. Part of the reason for the below average ranking for revenues per
660 fixed assets may be due to the Company's wide geographic area that services a relatively
661 small population base (i.e. the Company's customers per square mile of service territory is
662 below average). This requires PacifiCorp to invest in plant to service this large region
663 without the population density that other utilities have.

664

665 On the other hand the Company's operating income as a percentage of revenues is favorable
666 compared to the other companies which suggests relatively good cost control performance by
667 the Company. Despite this favorable performance, the Company has failed to earn its
668 authorized return on equity for a number of years.

669

670

671 **Q. What are your conclusions regarding comparable, or proxy, companies?**

672 A. I conclude that the companies I have selected and set forth on DPU Exhibit 4.4 and following
673 exhibits are reasonably similar to PacifiCorp. The financial ratio and rate of return analysis
674 indicates that PacifiCorp is generally close to the average of these proxy companies, although
675 it is not currently earning its authorized rate of return and the low revenue-to-fixed-asset
676 ratios are probably a practical result of the Company's extensive geography.

677

678 **D. APPLICATION OF COST OF EQUITY MODELS**

679 **Q. What is the consequence of the current economic situation on your equity models?**

680 A. In the first instance, all of the cost of equity models assume the existence of functioning
681 markets that are reasonably stable and rational. For the last quarter of 2008 through first
682 quarter 2009, it was questionable that this underlying assumption was valid. However, as
683 discussed above, the current economic situation and financial market status appears to be
684 reasonably "normal." Therefore, there is relatively little concern in this regard with using the
685 standard cost of equity models.

686

687 **1. Single-Stage DCF Models**

688 **Q. Please describe how you developed the Single-Stage DCF models.**

689 A. First, I calculated the current dividend yield for each of the comparable companies. The
690 dividend was based upon annualizing the latest quarterly dividend. I considered a 30 day
691 average closing price. The 30 day average closing price was used to smooth out random
692 noise that might exist in the stock price data. These stock prices were based upon the closing
693 prices as of April 25, 2011 and were obtained from Yahoo! Finance. Next, I took earnings

694 and dividend growth rates from the latest Value Line reports on each comparable company as
695 well as the latest updates on Value Line's web site accessed April 21, 2011, and combined
696 those with the consensus earnings growth estimates reported on the Yahoo! Finance, Zack's
697 and Reuters web sites for each comparable company; I also considered the recent Standard &
698 Poor's and Argus Research reports on these companies (collectively, "financial sources").
699 These financial sources were accessed via the internet on April 26, 2011. DPU Exhibit 4.5
700 sets forth the earnings growth rate forecasts. Included in DPU Exhibit 4.5 is an alternative
701 Value Line calculation explicitly based upon the latest historical earnings per share as
702 reported by Value Line in its 3- to 5-year forecast. DPU Exhibit 4.5 also contains 3 to 5 year
703 dividend growth forecasts from Value Line and Argus Research as well as Gross Domestic
704 Product growth forecasts.

705
706 I considered several different growth rate estimates for the single-stage models. First I
707 calculated growth rates based upon a weighted-average by applying a 75 percent weight to
708 the average earnings growth rate from the financial sources, and a 25 percent weight to the
709 average forecast dividend growth rate from Value Line and AUS, and to the earnings growth-
710 only models pursuant to the Commission's decision in Questar Gas Company, Docket No.
711 02-057-02. For comparison I have also made dividend growth-only calculations. DPU
712 Exhibit 4.6 sets forth these calculations of the DCF model using this weighted growth rate.
713 DPU Exhibit 4.7 sets forth my adjusted rates. The adjusted rates were derived by eliminating
714 any cost of equity estimates that were less than 9.0 percent or equal to or greater than 11.0
715 percent. The lower and upper bounds were selected based upon my judgment that a rate less
716 than 9.0 percent is unreasonable within this particular exercise and that the upper bound

717 eliminated Wisconsin Energy's noticeable out-sized and likely unsustainable growth
718 forecasts based upon the 75-25 percent weighting. All of these estimates are summarized on
719 DPU Exhibit 4.5.

720
721 Additional sets of single-stage DCF estimates are included on DPU Exhibit 4.8. On this
722 exhibit I have calculated cost of equity estimates using the historical 10-year average growth
723 in earnings and dividends as reported by Value Line. In the lower portion of these exhibits I
724 have calculated an adjusted cost of equity by eliminating certain estimates that were, in my
725 judgment, too low or too high. In this case I do not believe these results based upon
726 historical growth rates warrant significant consideration in the final estimate of the cost of
727 equity for PacifiCorp. However, a comparison between the actual growth rates and the
728 forecast growth rates is useful, and highlights the possibility that analysts' forecast growth
729 rates may be optimistic.

730
731 As set forth on DPU Exhibit 4.6, the results of the single-stage models using the 75-25
732 percent weighting, on earnings, and on dividend growth resulted in a range of 9.85 to 10.15
733 percent. The adjusted earnings-only growth models yielded a range of 9.92 to 10.9 percent.
734 I have given more weight to the forecast earnings models and the 75 percent EPS and 25
735 percent dividend forecast growth models.

736

737

738

739

740 **Q. In DPU Exhibit 4.5 a few earnings growth are negative. Is it reasonable to include a**
741 **negative growth rate when calculating a rate of return in this instance?**

742 A. Yes and no. The analyst growth rate forecasts are relatively short-term forecasts covering
743 three to five years. During a relatively brief interval a company's earnings can decline for
744 various reasons. For Entergy and Edison International, analysts have identified reasons for
745 the negative growth forecasts. Longer term, it is less reasonable to assume a negative growth
746 rate unless one expects a company to go out of business.

747

748 **Q. How did you deal with the negative growth rates?**

749 A. I left them in the mean growth rates calculated in DPU Exhibit 4.6 if the growth rate was
750 going to be used for short-term calculations. Specifically, in the two-stage models (discussed
751 below) if the first five years' dividend growth were based in whole or in part on the earnings
752 growth rate forecasts, then the negative growth rates were included in the estimate of the
753 near-term dividend growth. The two negative growth rates were excluded from both the
754 adjusted growth rates, which were used in all single-stage DCF models that included earnings
755 growth rates, and the two-stage models where the terminal stock price was determined by the
756 earnings growth rate forecast. In this way, the short-term growth rates accounted for the
757 possibility of negative growth, but in the longer term, such growth rates were assumed in this
758 case to be unreasonable and therefore excluded.

759

760

761

762

763 2. Two-Stage DCF Models764 **Q. Please describe the Two-Stage DCF models you used.**

765 A. In developing two-stage DCF models I forecast the current dividends of each comparable
766 company out five years in three different ways. First, I assumed that the dividends grew at
767 the average forecast dividend growth rate. Second, I assumed that the dividends grew at the
768 weighted average of 25 percent average forecast dividend growth rate and 75 percent of the
769 average forecast earnings growth rate. And lastly, I assumed average forecast earnings only.
770 In each case, for discounting purposes, the dividends were assumed to occur in the middle of
771 the year. A "sixth" dividend was forecasted to occur at the end of the fifth year. This sixth
772 dividend was used as a factor to estimate the terminal value.

773

774 The terminal value was calculated by dividing the sixth dividend by the cost of equity less a
775 terminal growth rate. The terminal growth rate was estimated two different ways. First, I
776 estimate the long-term growth rate using the average of the long-term forecast GDP growth
777 estimates set forth on DPU Exhibit 4.6 which was 4.62 percent. The second long-term
778 growth estimate is based upon the hypothesis that long-term growth will equal the adjusted
779 forecast earnings growth. This may be optimistic since the EIA is currently forecasting long-
780 term real growth in electric demand at 1.0 percent annually.³⁴ Adding a forecast long-term
781 inflation rate of about two percent, would require long-term productivity gains of 2.0 percent
782 annually to reach a five percent earnings growth rate. The high productivity gains seem
783 unlikely for the electric utility industry.³⁵ It is more likely that electric growth will be less

³⁴ Energy Information Administration (EIA), "Annual Energy Outlook 2011," DOE/EIA-0383(2011), Release Date: April 26, 2011.

³⁵ The U.S. Department of Labor, Bureau of Labor Statistics compiles data on labor productivity. For the period 2001-2008, the most recent period for which I can find comparable data, labor productivity across all business

784 than long-run GDP growth due to continued efforts at efficiency. In this regard (for energy
785 generally) Value Line has stated “[e]nergy use in the United States has traditionally increased
786 slowly as demand from a growing population and economy was partially offset by steady
787 gains in energy efficiency.”³⁶

788

789 DPU Exhibit 4.09 sets forth the calculations of the two-stage DCF growth rates based upon
790 the above forecast assumptions. The estimates from these two-stage DCF models range from
791 9.24 percent to 10.03 percent.

792

793 By design, the estimate based upon a terminal value using earnings growth is likely to be
794 toward the higher end of the range, because the terminal value arrived at by capitalizing
795 dividends at the earnings forecast growth rate gives the highest likely estimate.³⁷

796

797

798

799

800

801

increased at an average rate of 2.4 percent, whereas for power generation and supply (a subset of “Utility”) the growth rate was 0.3 percent.

http://www.bls.gov/lpc/ipr_aiin.pdf

<http://data.bls.gov/cgi-bin/surveymost?pr>

http://www.bls.gov/news.release/archives/prin_06102010.htm

<http://www.bls.gov/lpc/faqs.htm>

³⁶ Value Line Investment Survey, September 11, 2009, page 517.

³⁷ That is, the 5 percent average estimated growth rate is a faster growth rate than the economy as a whole is expected to grow going forward. A regulated utility is unlikely to grow faster than the economy for long periods of time. See Section VI. COMMENTS ON DR. HADAWAY’S COST OF EQUITY RESULTS for a further discussion regarding GDP growth rates and utility companies.

802 3. CAPM Results803 **Q. How did you develop your CAPM models?**

804 A. I looked at the CAPM model using different risk free rates, time periods, betas, and market
805 risk premiums. I did this to give the flavor of how different factors in the CAPM affect the
806 cost of equity estimate. As stated earlier, there is no consensus on precisely how the
807 components of the CAPM should be estimated.

808

809 **Q. What risk-free rates did you choose?**

810 A. I considered the average of the two weeks in April 2011 ending on the 22nd and the 29th
811 along with the overall April average. The average of the 90-day Treasury bill (T-bill) yield,
812 which was 0.06 percent; and the accepted figure for the 20-year Treasury bond was 4.25
813 percent. Academics have tended to use the T-bill rate, the closest rate to a “true” risk free
814 rate since it contains little inflation or time horizon risks. Practitioners often use longer-term
815 rates in order to match the assumed holding period of the asset under consideration. I favor
816 the longer-term rate and use the 20-year Treasury bond since it is approximately equivalent
817 to the long-term government bond historical series compiled by Ibbotson and Associates
818 (now part of Morningstar). Nonetheless, I show the results of the Treasury bill rate as the
819 risk-free rate in the CAPM. However, to be consistent, the estimated market risk premium
820 should correspond to the type of risk free rate one chooses.

821

822 One of the reasons that the Treasury bill gives noticeably lower CAPM results than the 20-
823 year bond is current Federal policy. The market turmoil of the recent past has led the U.S.
824 Federal Reserve to maintain policies that tend to keep short-term interest rates abnormally

825 low, especially when compared to longer-term bond rates. This is reflected in the historically
826 very low rate on the short-term 90-day U.S. Treasury bill. Therefore, at this time, I do not
827 consider the CAPM results using Treasury bills to be reasonable estimates of cost of equity.

828

829 **Q. What beta estimates did you use?**

830 A. For four of the five CAPM exhibits I used Value Line's latest adjusted beta. However, in
831 DPU Exhibit 4.11, page 3, I use an average of betas derived from financial sources excluding
832 Value Line. DPU Exhibit 4.10 summarizes the beta estimates for each comparable company
833 from the financial sources.

834

835 **Q. Please describe the market risk premiums you used.**

836 A. All of my market risk premiums are derived from historical data published by Ibbotson
837 Associates. These data have been the subject of criticism for a number of reasons, some of
838 which were cited above. I consider the 84 year "Ibbotson period" to be problematic since it
839 reflects market situations much different than today. The most obvious examples include the
840 rise of mutual funds for small investors and more recently exchange traded funds (ETFs) as
841 well as the internet making public information almost instantaneously available anywhere in
842 the world. There are also institutional changes since 1926 such as the creation of the
843 Securities and Exchange Commission, multitudinous changes in accounting rules, and the
844 Sarbanes-Oxley legislation. Furthermore, there have been suggestions and studies that
845 indicate investors' expectations may change over time. Thus a long historical period may not
846 accurately reflect today's market and expectations.

847

848 **Q. What historical period, if any, would you recommend?**

849 A. I feel most comfortable with a 30- to 50-year time period. A 30- to 50-year period is long
850 enough to smooth out the sometimes wide fluctuations in the data, but short enough to focus
851 on the more recent data of the modern financial markets. However, a 30- to 50-year period
852 does not avoid all of the pitfalls of using historical data. Some authorities recommend that at
853 least 30 years be used when basing an estimate on historical data.³⁸

854

855 **Q. Why do you include calculations in three of your CAPM exhibits that reflect the 82-**
856 **year time period?**

857 A. Because this time period has been widely promoted by Ibbotson and others as the “correct”
858 time period, I did not want to exclude it completely from my analysis. I also wanted the
859 Commission to be able to evaluate for itself the results of using that time period but applying
860 different betas or using geometric as opposed to arithmetic averages.

861

862 However, the 1926-to-the-present period market risk premium as advocated by Ibbotson
863 represents an estimate that in my opinion is biased upwards. For example, in the proceedings
864 of a conference on market risk premium sponsored by the AIMR published in November
865 2001, of all the experts presenting at the conference, the Ibbotson representative’s calculation
866 was at the top end at 7 percent. Most of the experts thought that the market risk premium
867 should be 5 percent or less going forward, and some were as low as 2 percent, or even less.³⁹

³⁸ PPC’s Guide to Business Valuations, Volume 1, paragraph 502.9, Practitioners Publishing Company, Fort Worth Texas, February 2006.

³⁹ AIMR, Equity Risk Premium Forum Report, November, 2001, pages 30-50. Also, see Shannon Pratt who discusses another reason to think the market risk premium is lower than the long-term historical Ibbotson data (Pratt, Shannon. “Values should lower equity risk premium component of discount rate,” Business Valuation, 9 (11), November, 2003, pages 1,6.).

868 Thus while I am willing to include the results for the 1926-to-the-present period for the
869 consideration of the Public Service Commission, I believe these estimates may not be
870 appropriate.

871

872 **Q. What were your results from CAPM?**

873 A. The CAPM models using the 20-year T-bond yields as the risk free rate range from 7.27
874 percent to 8.73. DPU Exhibit 4.11 details the CAPM calculations. I only consider the 8.73
875 percent as set forth on DPU Exhibit 4.3.

876

877 **Q. Can the CAPM results be considered reasonable?**

878 A. They might be given some consideration since they reflect the current value given by this
879 widely used model. The CAPM range is 300 to 450 basis points above the risk-free rate,
880 which is fairly typical for utility companies. Given the opportunity to earn 4.25 percent on a
881 Treasury bond, or 7.25 to 8.75 percent on a utility stock, an investor may well choose the
882 utility stock as a reasonable expected return for the additional risk.⁴⁰

883

884 4. Risk Premium Results

885 **Q. What were the results of your risk premium model based upon Value Line financial**
886 **strength weightings?**

887 A. The results ranged from 7.94 to 9.96 percent based upon the 20-year Treasury bond, the latter

⁴⁰ Aswath Damodaran, a professor of finance at the Stern School of Business, New York University, and a leading expert in this field publishes monthly estimates of the equity risk premium (ERP) based upon the current level of the S&P 500 index, the estimated dividend rate for the S&P 500 and the current expected growth rate for that index. His estimated ERP on April 1, 2011 was 5.31 percent and 5.16 percent on May1. This implies an expected return for the market of around 9.50 percent (by adding a 4.25 percent risk free rate to the ERP). Given that utilities are considered less risky than the stock market as a whole, the CAPM results in the 7 to 9 percent range would be considered reasonable. <http://pages.stern.nyu.edu/~adamodar/> Last accessed May 5, 2011.

888 figure being roughly 120 basis points higher than the highest CAPM result. Again, I do not
889 consider the Treasury bill-based results to be particularly useful. DPU Exhibit 4.12 details
890 these results.

891

892 **Q. What do the risk premium results suggest to you?**

893 A. The risk premium results support the high-end CAPM result, and the low-end DCF results. I
894 give some consideration to them in that they are suggestive that the DCF model results may
895 be too high.

896

897

898 **VI. COMMENTS ON DR. HADAWAY'S COST OF EQUITY RESULTS**

899

900 **Q. Please outline your comments on Dr. Hadaway's cost of equity testimony.**

901 A. I will first comment briefly on areas that I am in general agreement with Dr. Hadaway. Then
902 I will discuss areas of differences and disagreements. I do not attempt to comment on all
903 statements and calculations made by Dr. Hadaway; therefore, silence regarding a particular
904 statement or comment does not necessarily mean that I agree with what Dr. Hadaway has
905 said or done.

906

907 **Q. Please outline the areas of general agreement you have with Dr. Hadaway.**

908 A. I generally agree with Dr. Hadaway's discussion of the development of the DCF models and
909 their strengths. I also generally agree with his discussion regarding the problems with
910 CAPM. I would continue to point out, however, that CAPM appears to remain the most

911 widely used model to estimate cost of equity. The other point I would make is that all models
912 have their supporters and detractors. This brings into question the direct use of earnings
913 growth rates, whether forecast or historically based. The problem with these questions is
914 what should the replacement model be? CAPM and other risk premium models have their
915 problems as well.

916

917 As I alluded to earlier, I have included in my list of comparable companies nine of Dr.
918 Hadaway's 20 comparable or proxy companies, so I am in agreement with his comparable
919 companies to that extent. I agree with Dr. Hadaway's general formulation of his DCF model
920 and also agree with the use of analyst growth forecasts. That outlines my general agreements.

921

922 **Q. With regard to differences or disagreements, let us start with the comparable**
923 **companies. Why did you not include the other 10 companies that Dr. Hadaway**
924 **included?**

925 A. The bottom part of DPU Exhibit 4.4 summarizes my reasons for excluding these 10
926 companies in the "comments" section. ALLETE, Black Hills, DPL, Empire, IDACORP and
927 Portland General were judged to be too small based on the criteria I outlined earlier. Vectren
928 has relatively low electric utility operations and is more of a natural gas utility than an
929 electric utility. NextEra and Sempra have significant non-regulated operations accounting for
930 half or more of the parent company. Finally, Duke and Progress are in the process of
931 merging. Based upon these observations, I have elected to exclude these 11 companies from
932 my comparable list.

933

934 **Q. What is your disagreement with Dr. Hadaway's DCF models?**

935 A. While Dr. Hadaway computes DCF results based upon analyst forecasts, he puts little or
936 no weight on these results. As he did in his testimony in the previous PacifiCorp general rate
937 cases, Dr. Hadaway concludes that the best growth rate based upon a weighted average of
938 historical changes in nominal gross domestic product (GDP) going back to 1947, basically
939 the post World War II period. His current calculation gives a weighted average change of 6.0
940 percent. While it is omitted this time, in an earlier PacifiCorp rate case, Docket No. 07-035-
941 93, he sought to bolster his assertion that GDP is a proper growth estimate by presenting a
942 chart on page 30 of his testimony comparing electric demand with real GDP. Although he
943 avoided providing the actual statistics along with his chart, two things are completely clear
944 from this chart: (1) real GDP and electric demand are positively correlated, and (2) electric
945 demand has been growing at a noticeably slower rate than real GDP at least since 1982. It
946 should not be surprising that electric demand grows at a slower rate than the economy as a
947 whole since consumers at all levels of the economy have various incentives to continuously
948 improve their energy efficiency.

949
950 Assuming that GDP growth is a reasonable estimate for electric utilities, the growth rate used
951 must reflect investors' expectations of future growth. Rather than calculate some weighted
952 average of past GDP growth rates, I believe Dr. Hadaway would have better served the
953 Commission by obtaining long-term GDP forecasts. For example, the U.S. Congressional
954 Budget Office (CBO) publishes 10-year GDP forecasts annually; the current version is
955 CBO's Economic Projections for Calendar Years 2011 to 2021 (updated January 2011).
956 Likewise the EIA annually publishes its long-term GDP forecast in *Annual Energy Outlook*

957 2011 (April 26, 2011). Currently both the CBO forecast and the EIA is for nominal GDP to
958 grow 4.62 percent annually over the 2010 to 2021. If these estimates of GDP growth were
959 used in Dr. Hadaway's DCF models, his results would be about a percentage point less than
960 he reported in his direct testimony.

961
962 Dr. Hadaway computed two risk premium models whereby he analyzes average electric
963 utility authorized rates of return and compares them to average public utility bond yields as
964 compiled by Moody's over the 1980 to 2010 time period. From these data Dr. Hadaway
965 imputes an equity return of 10.24 percent for the first model, and 10.10 percent for the
966 second model. There are questions about the reliability of published authorized rates of return
967 as estimates of cost of equity and the comparability of these rates of return to the average
968 public utility bond yield. For example, many of the rates may be based upon negotiated
969 settlements for which tradeoffs between stated cost of equity rates and other parts of the rate
970 case may have been made. Another question is the policies in the different jurisdictions in
971 terms of what evidence for rate of return testimony is accepted and how the regulators
972 ultimately use that testimony. At a minimum, authorized returns are not direct market
973 observations, and should only be useful if no direct market observations were available.

974
975 A final observation regarding the average authorized rates of return analysis. If the point is
976 to use these data to support Dr. Hadaway's estimate for an authorized rate of return, it seems
977 straight forward to do a simple time-trend analysis. DPU Exhibit 4.13 analyzes the
978 authorized return data found on Schedule 5 of Dr. Hadaway's testimony in this docket along
979 with the utility bond data he uses. The simple trend analysis predicts that authorized returns

980 in 2011 will approximate 9.39 percent. When viewed along with the trend in the bond yields,
981 these data may suggest only the principal of gradualism in regulation in response to changing
982 interest rates is in operation, not some “law” of financial economics. These data may also say
983 something about the timing of rate applications; that is, a utility may choose when to come in
984 for a rate case when the utility believes the results from the rate case will be most favorable
985 to it.⁴¹ However, a trend analysis doesn’t predict changes in the trend. Thus my analysis here
986 only serves to show an alternative way to analyze Dr. Hadaway’s data and not, in this case at
987 least, to estimate what PacifiCorp’s allowed rate of return should be.

988

989 Some of the differences between my calculations and Dr. Hadaway’s relate to the differences
990 in time. Since Dr. Hadaway prepared his analyses, analysts have reduced their forecast
991 growth rates somewhat. Also stock prices are higher which have reduced dividend yields.

992 For reasons stated earlier, my list of comparable companies is not the same as his.

993 Additionally, since Duke and Progress have announced that they are merging, presumably
994 Dr. Hadaway would exclude them from his comparables list today. The exclusion of Duke
995 and Progress would likely reduce Dr. Hadaway’s conclusion by about 10 basis points, all else
996 being equal. The effect of reducing Dr. Hadaway’s historical weighted average GDP growth
997 rate to a 4.62 percent forecast GDP growth rate would reduce his estimates using GDP
998 growth by about 140 basis points.

999

1000

1001 In his direct testimony, Dr. Hadaway concludes that the appropriate return on equity for

⁴¹ Phillips, Charles F. Jr. The Regulation of Public Utilities Theory and Practice. 1993. Public Utilities Reports, Inc. Arlington, VA, pages 408-409.

1002 PacifiCorp should be 10.50 percent, near the high end of his reasonable range of 10.1 to 10.7
1003 percent. As noted above, eliminating Duke and Progress would likely move his reasonable
1004 range to 10.0 to 10.6 percent. The other factors, such as the time differential, would move it
1005 still lower. My conclusion is that Dr. Hadaway would have arrived at a result similar to my
1006 conclusion if he had made his calculations during the same time frame I did, had not included
1007 the models based upon the 6.0 percent GDP growth rate, and updated his list of comparable
1008 companies to exclude Duke and Progress. With these modifications, Dr. Hadaway's results
1009 support my own conclusions.

1010

1011

1012

VII. CONCLUSIONS AND RECOMMENDATIONS

1013

1014 **Q. Please summarize your cost of capital and capital structure conclusions, excluding the**
1015 **cost of equity results.**

1016 A. I have concluded that the Company's requested cost of preferred stock and long-term debt is
1017 reasonable. I have also concluded not to challenge the Company's proposed capital structure.

1018

1019 **Q. What conclusions with respect to cost of equity have you come to?**

1020 A. The first conclusion is that the DCF models using analyst forecasts form a reasonable basis
1021 for a cost of equity estimate. These DCF models are compared to alternative CAPM
1022 calculations as well as my own risk premium model. All of these models support an overall
1023 conclusion of a cost of equity estimate in the 9.85 to 10.15 percent range. After reviewing all
1024 of the data I concluded that a point estimate of 10.0 percent is appropriate.

1025

1026 **Q. Please discuss some of the implications of your weighted cost of capital estimate and**
1027 **specifically your cost of equity estimate.**

1028 A. In arriving at a decision on cost of capital, the Commission needs to consider principles and
1029 issues set forth in the well known U.S. Supreme Court decisions commonly referred to as the
1030 Bluefield and Hope cases.^{42,43}

1031

1032 The Bluefield and Hope cases established economic and financial principles for proper
1033 regulation. These principles included (1) that the utility be allowed to earn a return on its
1034 utility property generally equal to returns earned by other companies of similar risk; (2) this
1035 return should assure confidence in the financial soundness of the utility; (3) this allowed
1036 return should maintain and support the credit of the company and allow it to attract capital;
1037 (4) recognition that a return that is “right” at one time may become high or low by changes in
1038 the economy regarding alternative investments; and (5) particularly in Hope, what is
1039 important is that the “end result” of the rate order be just and reasonable; it is less important
1040 how that result is arrived at. While the above list reflects the rights of the utility, Hope and
1041 Bluefield balance those rights with the obligation that “just and reasonable” rates include
1042 fairness to the customers.

1043

1044

1045

1046

⁴² Bluefield Water Works and Improvement Company v. Public Service Commission, 262 U.S. 679, (1923).

⁴³ Federal Power Commission v. Hope Natural Gas Company, 320 U.S. 591, (1944).

1047 **Q. Do you believe your conclusions and recommendations arrive at a just and reasonable**
1048 **result in the public interest? Please explain.**

1049 A. Yes. My recommended capital structure is well within the norms of the Company's industry
1050 as indicated by the analysis comparing the Company's recommended capital structure with
1051 the comparable companies. It is also well within the range of equity capital percentages
1052 required by Moody's and other rating agencies for the maintenance of an "A" debt rating.
1053 The use of embedded cost of debt and preferred stock is well established in regulation. The
1054 prospective future debt issuance is assumed to pay the forecast expected market return. I
1055 have demonstrated that my cost of equity estimate sits well within the estimates arrived at
1056 using standard financial models and forecasts derived from market participants. Some of Dr.
1057 Hadaway's results would also support a 10.0 percent cost of equity when adjusted for
1058 changes since Dr. Hadaway performed his analyses. As a result, I conclude that the 10.0
1059 percent cost of equity is not outside any range of expectations of Wall Street. Therefore I
1060 conclude that at this time the cost of capital estimates set forth on DPU Exhibit 4.2 are just
1061 and reasonable and in the public interest.

1062

1063 **Q. What is your recommendation?**

1064 A. As set forth on Exhibit DPU 4.2, my recommendation is that for PacifiCorp and its division,
1065 Rocky Mountain Power, the Commission adopt as the authorized cost of equity for its
1066 operations in Utah of 10.0 percent and an overall weighted average cost of capital of 7.98
1067 percent.

1068

1069

1070 **Q. Does this conclude your testimony?**

1071 A. Yes.