

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

* * * *

IN THE MATTER OF THE APPLICATION OF)
PUBLIC SERVICE COMPANY OF COLORADO)
FOR APPROVAL OF ITS 2011 ELECTRIC) DOCKET NO. 11A-869E
RESOURCE PLAN)

IN THE MATTER OF THE APPLICATION OF)
PUBLIC SERVICE COMPANY OF COLORADO)
FOR APPROVAL OF THE ACQUISITION OF)
THE BRUSH 1, 3, AND 4 GENERATION)
FACILITIES AND IN CONNECTION) DOCKET NO. 12A-782E
THEREWITH THE GRANT OF A CERTIFICATE)
OF PUBLIC CONVENIENCE AND NECESSITY)
IF REQUIRED AND THE APPROVAL OF COST)
RECOVERY THROUGH A GENERAL RATE)
SCHEDULE ADJUSTMENT)

IN THE MATTER OF THE APPLICATION OF)
PUBLIC SERVICE COMPANY OF COLORADO)
FOR APPROVAL OF THE POWER PURCHASE)
AGREEMENT FOR 118.8 MW OF NATURAL) DOCKET NO. 12A-785E
GAS GENERATION, EARLY RETIREMENT OF)
ARAPAHOE UNIT 4, AND A GAS SALES)
AGREEMENT.)

SUPPLEMENTAL REBUTTAL TESTIMONY OF JAMES F. HILL

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

October 5, 2012

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- 1 I. INTRODUCTION
- 2 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.
- 3 A. James F. Hill, 1800 Larimer Street, Denver, Colorado 80202.

1 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT POSITION?**

2 A. I am employed by Public Service Company of Colorado. My position is Director,
3 Resource Planning and Bidding.

4 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING?**

5 A. I am testifying on behalf of the Public Service Company of Colorado (“Public
6 Service”, “Public Service”, or “Company”).

7 **Q. HAVE YOU PROVIDED TESTIMONY IN THIS DOCKET?**

8 A. Yes, Direct, Supplemental Direct, Second Supplemental Direct and Rebuttal.

9 **Q. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL REBUTTAL**
10 **TESTIMONY?**

11 A. The purpose of my supplemental rebuttal testimony is to: rebut Mr. Monsen’s
12 argument that the Company provided an incomplete cost/benefit analysis with
13 respect to our proposed acquisition of the Brush units; to address Mr. Camp’s
14 concern about how the expected useful lives of the Brush units affect this
15 cost/benefit analysis; respond to Intervener requests that the Company use
16 STRATEGIST modeling to compare bids against operating Cherokee 4 on
17 natural gas; and, address Ms. Podein’s concerns regarding the STRATEGIST
18 modeling used to analyze the Southwest Gen PPA. Finally, I address Mr. Cox’s
19 criticisms of the Company’s Arapahoe analysis.

1 **II. THE BRUSH ANALYSIS**

2 **Q. MR MONSEN CLAIMS THAT THE COMPANY’S COST BENEFIT ANALYSIS**
3 **FOR THE ACQUISITION OF THE BRUSH UNITS WAS INADEQUATE. WHAT**
4 **IS HIS BASIS FOR THIS CLAIM?**

5 A. Mr. Monsen takes the position that the costs the Company used to represent
6 future replacement power costs for the Brush units once the existing PPAs expire
7 in our cost benefit analysis is not representative of the likely prices Public Service
8 will see in response to the All-Source solicitation that we will conduct in Phase 2
9 of this ERP.

10 **Q. WHAT DID PUBLIC SERVICE USE TO REPRESENT FUTURE**
11 **REPLACEMENT POWER COSTS IN THE BRUSH COST-BENEFIT**
12 **ANALYSIS?**

13 A. Three different future replacement power scenarios were represented. We used:
14 1) the cost of the existing Brush PPAs; 2) the cost of the generic RAP CT; and, 3)
15 the cost of a generic greenfield CT.

16 **Q. WHY DOES MR MONSEN BELIEVE THAT THESE THREE FUTURE PRICING**
17 **SCENARIOS ARE NOT SUFFICIENT?**

18 A. It appears Mr. Monsen’s position is that Public Service described these three
19 replacement power scenarios as being representative of future PPA pricing from
20 the Brush units (*i.e.*, after the existing PPAs expire) and therefore these pricing
21 scenarios do not represent likely prices for PPAs from other generation that
22 might be bid into the Phase 2 All Source RFP.

1 **Q. DO YOU AGREE WITH THIS POSITION?**

2 A. No. The RAP CT and Greenfield CT replacement power pricing scenarios used
3 in the Brush analysis represent a reasonable range of what Public Service is
4 likely to see for PPA pricing from other gas-fired peaking resources in the Phase
5 2 All-Source Solicitation. The RAP CT pricing is specifically intended to represent
6 what we could expect for pricing from owners of existing gas-fired generating
7 units in Phase 2 that are attempting to price their bids under the cost of new
8 Greenfield construction.

9 It appears that Mr. Monsen's entire argument on this issue is based purely
10 on the fact that Public Service described the replacement power prices used in
11 the Brush analyses as being reflective of future PPA prices from the *Brush*
12 assets as opposed to being representative of likely PPA prices from *other*
13 generation assets in the Phase 2 solicitation. Our position is that the replacement
14 power costs we modeled can be assumed as reasonable representations of
15 *either* a bid from the Brush units *or* a bid from another generation owner. We
16 modeled what we believed to be likely price levels we would receive from bidders
17 in the Company's All-Source solicitation. Of course, if the Company does not
18 acquire the Brush units, we must honor the existing PPAs that we have with the
19 owners of the Brush units. Our cost-benefit analyses compare, therefore, the cost
20 of acquiring the Brush units *versus* continuing the Brush PPAs through their term
21 and then replacing that Brush generation capacity with market-priced
22 replacement power (whether through a PPA with the Brush owners or with

1 another IPP). As I mentioned earlier, in evaluating what that replacement power
2 market price might be, we looked at three different pricing possibilities: 1) a price
3 that reflects the current Brush PPAs, which I refer to as the “Flat Tail”; 2) a price
4 reflecting the cost of a RAP combustion turbine;¹ and, 3) a price reflecting the
5 cost of a Greenfield combustion turbine. These price points provide a
6 reasonable expectation for comparing 1) Public Service’s cost of acquisition of
7 the Brush units *versus* 2) the potential outcomes of not acquiring the Brush units,
8 honoring the Brush PPAs for the remainder of the existing contract terms and
9 then replacing the Brush generation at the end of the contract terms with
10 generation bid into this All-Source RFP and subsequent solicitations.

11 **Q. ON PAGE 6 OF HIS SUPPLEMENTAL ANSWER TESTIMONY MR. MONSEN**
12 **ALSO ARGUES THAT PUBLIC SERVICE DID NOT PROVIDE ANY**
13 **INDICATION THAT THE BRUSH ACQUISITION WOULD BE COST-**
14 **EFFECTIVE COMPARED TO THE PRICING OF A BROWNFIELD**
15 **COMBUSTION TURBINE. WHAT IS YOUR RESPONSE TO THIS CRITICISM?**

16 A. I don’t agree with Mr. Monsen’s representation of our testimony in this regard.
17 While the Company did not specifically discuss how acquisition of the Brush
18 assets would compare with the cost of a brownfield CT, we did provide
19 information indicating how Brush would fare versus a brownfield CT.

20 **Q. PLEASE EXPLAIN.**

¹ RAP refers to Resource Acquisition Period in the PSCo 2011 ERP. A RAP combustion turbine is priced at the midpoint of brownfield and greenfield estimates. See Section 2.8 of the PSCo 2011 ERP for retails on the prices of the combustion turbines.

1 A. There are two places in my Direct Testimony in support of the Brush acquisition
2 that contain the information reflecting how acquiring Brush would compare with
3 replacement costs priced at the cost of a brownfield CT. The first is Table JFH-4
4 on page 11. Case 3 (RAP CT) and Case 4 (Greenfield CT) of this table indicate
5 that ownership is expected to save customers \$61 million and \$92 million
6 (PVRR) respectively.

7 In my Direct testimony (page 10 of Hill Direct Testimony in Docket No.
8 12A-782E, footnote 4), I point out that the Company estimated the cost of a
9 brownfield CT (low end of new construction costs) and a Greenfield CT (high
10 end), and then used the midpoint between the two to represent the "RAP CT".
11 The \$61 million PVRR savings associated with the RAP CT is \$31 million PVRR
12 less than the Greenfield CT savings. Since the RAP CT cost is the mid-point
13 between brownfield and Greenfield CTs, you can subtract the \$31 million from
14 the \$61 million and conclude that a using a brownfield CT as the replacement
15 resource in the analysis would yield a PVRR savings of \$30 million.

16 **Q. IS IT REALLY THAT SIMPLE??**

17 A. Yes. The difference between the Table JFH-4 RAP CT (Case 3) and Greenfield
18 CT (Case 4) replacement power costs are the fixed costs associated with these
19 generic CTs. The variable costs of these two CTs are identical (*i.e.*, heat rate and
20 variable O&M). As a result, one can scale the results of the RAP CT and
21 Greenfield CT to arrive at a good estimate of the savings ownership of the Brush

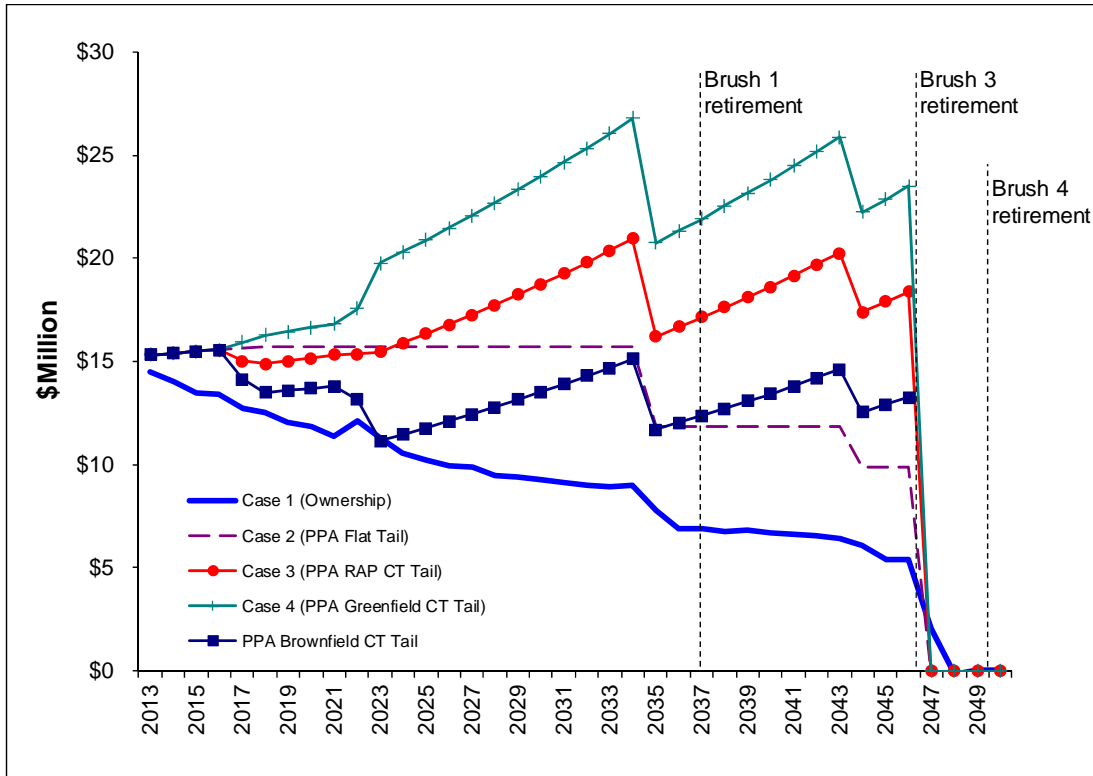
1 units would bring versus continuing under the Brush PPAs and then replacing
2 this generation with a PPA from a brownfield CT.

3 **Q. WHERE IS THE SECOND PLACE IN YOUR TESTIMONY THAT PROVIDES**
4 **AN INDICATION OF HOW OWNING THE BRUSH UNITS WOULD COMPARE**
5 **WITH BROWNFIELD CT PRICING?**

6 A. Figure JFH-1 on page 13 of my Direct testimony in support of the Brush
7 Application provides more information. Again knowing that the RAP CT is priced
8 at the mid-point between the brownfield CT and Greenfield CT, through
9 inspection of Figure JFH-1 one can visually estimate that the cost line for a
10 brownfield CT case and see that such a line would be higher cost than the Case
11 1 ownership costs. This is because the RAP CT case is, by definition, the
12 midpoint between the Brownfield CT case and the Greenfield CT case. To help in
13 that visualization, I have added that cost line in my Figure JFH2 below:

1

Figure JFH-2: Annual Fixed Costs of Brush + Brownfield Case



2 **Q. DOES MR. MONSEN PROVIDE WHAT HE THINKS WOULD BE**
3 **REPRESENTATIVE OF THE PPA PRICING PUBLIC SERVICE IS LIKELY TO**
4 **SEE IN PHASE 2?**

5 A. Yes. He takes the position that the Southwest Gen PPA for the output from
6 Arapahoe 567 pricing is the best information available for estimating Phase 2
7 PPA pricing.

8 **Q. DO YOU AGREE?**

9 A. No.

1 **Q. WHAT ARE THE MAJOR DIFFERENCES BETWEEN THE SOLICITATION TO**
2 **REPLACE ARAPAHOE 4 AND THE ALL-SOURCE SOLICITATION THAT**
3 **WILL BE USED TO MEET THE 345 MW OF CAPACITY NEED?**

4 A. The Southwest Gen PPA was specifically targeted to compete with Arapahoe 4
5 operating on gas for years 2014-2023. In contrast, the Phase 2 bids submitted
6 within an All-Source solicitation will be competing to serve some or all of the
7 Resource Acquisition Period capacity need of 345 MW starting in 2017.² Thus,
8 the solicitation seeking bids to serve as alternatives to burning gas in Arapahoe 4
9 was limited to a select pool of bidders, that is, owners of existing gas-fired
10 generation that had a PPA with Public Service which expired during the RAP.
11 In addition, the cost of operating Arapahoe 4 on gas was made available to both
12 of these bidders in the ERP so these bidders knew the price they had to beat.
13 The price they had to beat was low, due to the almost fully depreciated nature of
14 Arapahoe 4. These are significantly different circumstances than the
15 circumstances bidders will face in Phase 2. The Phase 2 process will seek to fill
16 345 MW of capacity need starting in 2017 (three years later than 2014) through
17 an All-Source RFP in which developers of all generation technologies will be
18 allowed to participate, many of which are expected to propose the construction of
19 new generating facilities. As a result I don't agree that the Southwest Gen PPA
20 to replace Arapahoe 4 is the best representation of the PPA pricing we will see in
21 the Phase 2 All-Source RFP. We think bidders will price their offerings to what

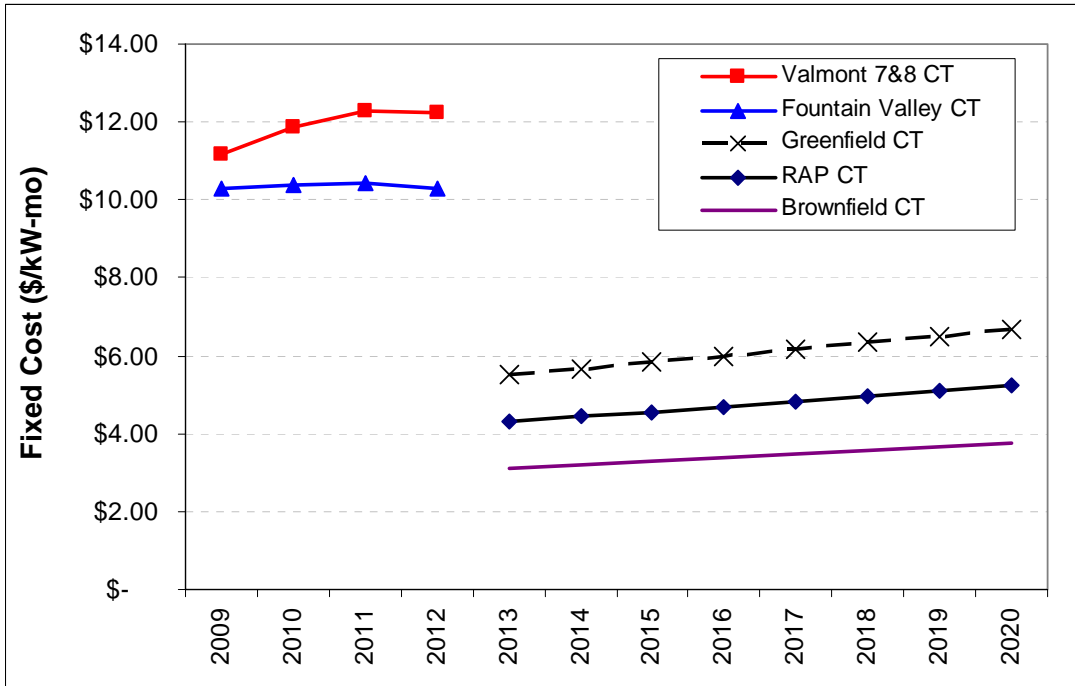
² The capacity need will be updated prior to Phase 2 using the most recent demand forecast.

1 they believe the market will bear (e.g., up to the cost constructing new generation
2 facilities) and that the generic RAP CT is a better proxy for what those prices are
3 likely to be³.

4 **Q. BOTH MR. MONSEN AND MS. PODEIN CLAIM THAT SINCE THE GENERIC
5 RAP CT AND GREENFIELD CT PRICING REPRESENT NEWLY
6 CONSTRUCTED UNITS, THE PRICING MAY BE TOO HIGH FOR PURPOSES
7 OF ESTIMATING PPA BID PRICES IN PHASE 2. WHAT IS THE \$/KW-MO
8 FIXED COST OF THESE GENERIC CTs USED IN THE BRUSH ANALYSIS?**

9 **A.** Figure JFH-3 contains generic Brownfield CT, RAP CT and Greenfield CT fixed
10 costs.

Figure JFH-3: Annual Fixed Costs of Generic CTs



³ Southwest Gen’s witness David Rhodes also suggested that Southwest Gen might increase its bid price if forced to wait for a new PPA for Arapahoe 5,6,7 until 2017.

1 This figure also shows how these generic fixed costs compare with the fixed
2 costs of the Southwest Gen Valmont 7&8 and Southwest Gen Fountain Valley
3 PPAs⁴, both of which recently expired. The Company anticipates Southwest Gen
4 will offer new PPAs for these CT facilities in Phase 2. Whether Southwest will
5 offer PPA pricing down to the level of the generic CTs (*i.e.*, approximately half
6 their prior contract pricing) won't be known until Phase 2. Nevertheless, I believe
7 this figure puts the generic CT pricing into perspective relative to past CT PPA
8 prices, and provides an indication that, contrary to the suggestions of Mr.
9 Monsen and Ms. Podein,⁵ the generic CT prices are reasonable for purposes of
10 estimating Phase 2 PPA pricing.

11 **Q. IN HIS TESTIMONY REGARDING THE COMPANY'S ESTIMATED COST**
12 **SAVINGS OF OWNING THE BRUSH GENERATION, DOES MR. MONSEN**
13 **DISPUTE THE SAVINGS SHOWN IN TABLE JFH-2 OF YOUR DIRECT**
14 **BRUSH TESTIMONY ASSOCIATED WITH EARLY TERMINATION OF THE**
15 **EXISTING BRUSH PPAs?**

16 A. No. Mr. Monsen's testimony focuses on whether the estimates used in our Brush
17 analysis to reflect future replacement power pricing (*i.e.*, the "tails") after the
18 existing Brush PPAs expire are representative of the PPA pricing we are likely to
19 see in Phase 2. He does not dispute the \$11.4 million (PVRR) in savings that

⁴ Based on costs collected through the Purchase Capacity Cost Adjustment (PCCA) for years 2009-2011 and a forecast for what will be collected in 2012.

⁵ See Podein supplemental answer testimony page 20 lines 22-23 and page 21 lines 1-6.

1 our customers will realize in the early years by early termination of the existing
2 Brush PPAs.

3 **III. THE AGE OF THE BRUSH UNITS**

4 **Q. WHAT ISSUE HAS BEEN RAISED REGARDING THE AGE OF THE BRUSH**
5 **UNITS?**

6 A. The issue involves the remaining useful lives of the Brush units. These units
7 were in operation outside of Colorado prior to the time they were reconditioned to
8 like new condition and installed in Colorado at the Brush location. Staff witness
9 Eugene Camp discusses in his supplemental answer testimony that it is the age
10 of the units that drives many of Staff's concerns about the Company's application
11 for approval of the purchase of the Brush assets. Specifically, Mr. Camp
12 questions whether the units can continue to operate over the remaining useful
13 lives estimated by the Company (*i.e.*, 22 years, 31 years, and 34 years for Brush
14 1, 3, and 4 respectively).

15 **Q. HOW DID THE COMPANY REFLECT THESE ESTIMATED REMAINING**
16 **USEFUL LIVES IN ITS ANALYSIS OF THE BRUSH UNITS?**

17 A. These remaining lives influenced the depreciation rate for the units, as well as
18 the time period over which operation of the Brush units was compared to
19 estimates of what it would cost Public Service to replace the power from these
20 units when their current PPAs expire. These replacement cost comparisons
21 (discussed in my Direct Brush testimony) considered the entire remaining useful
22 lives of each unit. Based upon these lives, I concluded that our customers would

1 save between \$46 million and \$92 million (PVRR) if the Company owned the
2 Brush units.

3 **Q. DID THIS ANALYSIS OF THE BRUSH UNITS IDENTIFY HOW MANY MORE**
4 **YEARS THE BRUSH UNITS WOULD HAVE TO OPERATE IN ORDER FOR**
5 **CUSTOMERS TO IN EFFECT “BREAK EVEN” ON THE ACQUISITION?**

6 A. No.

7 **Q. IS THERE A WAY TO ESTIMATE HOW LONG THE BRUSH UNITS WOULD**
8 **NEED TO CONTINUE IN OPERATION TO REACH A “BREAK EVEN” DATE?**

9 A. Yes. Through an assessment of: 1) the accumulated savings customers will
10 realize from the acquisition of the Brush units; and, 2) the remaining book
11 depreciation⁶ to be collected from customers, we can identify when the two cost
12 streams equate to each other. At that future date, if Public Service retired the
13 units and collected from customers the remaining book depreciation for these
14 units, customers would have been indifferent to the Company’s acquisition of the
15 Brush units.

16 **Q. DID THE COMPANY PROVIDE THE INFORMATION NECESSARY TO**
17 **PERFORM SUCH AN ASSESSMENT IN CONNECTION WITH ITS DIRECT**
18 **TESTIMONY FOR BRUSH?**

19 A. Yes. The annual savings of owning the Brush units that are contained in Figure
20 JFH-1 of my Direct Brush testimony were provided to parties as work papers.
21 From this information one can calculate the accumulated present value of

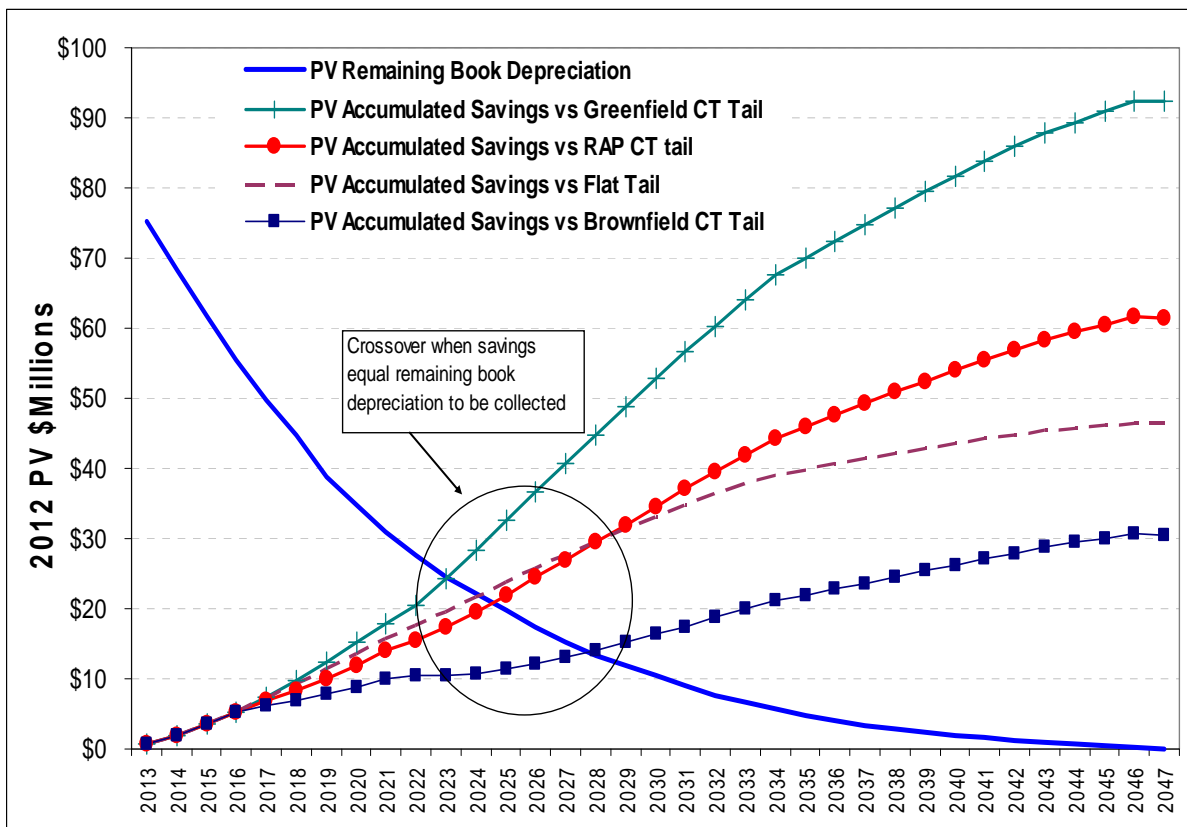
⁶ Which includes the estimated cost for decommissioning and dismantlement.

1 savings customers will realize for every year the Brush units are operated.
2 Similarly, the remaining book depreciation to be recovered for the units was
3 provided to parties in the work papers associated with Debbie Blair's Direct
4 testimony in the Brush Docket. From this information one can see how much of
5 the ~\$75 million acquisition cost plus dismantling costs remains to be collected
6 from customers over time.

7 **Q. HAS THE COMPANY ASSESSED THIS INFORMATION TO DETERMINE**
8 **WHEN THIS "BREAK EVEN" DATE WOULD OCCUR?**

9 A. Yes. Figure JFH-4 contains the results of this assessment. This figure shows
10 how the present value of the remaining book depreciation cost of the Brush units
11 declines over time. The figure also shows the present value of accumulated
12 savings over time associated with the four scenarios of future replacement costs
13 (i.e., Flat Tail, Brownfield Tail, RAP CT Tail, and Greenfield CT tail). Note that the
14 present value of savings for these tails match those reported in Table JFH-4 of
15 my Direct Brush testimony (i.e., \$46M Flat Tail, \$61M RAP CT Tail, \$92M
16 Greenfield CT Tail). The present value of savings from the Brownfield Tail is
17 approximately \$30 Million.

Figure JFH-4:



1 Q. WHAT WAS THE RESULT OF THIS ASSESSMENT?

2 A. In the cases analyzed, the accumulated savings from ownership of the Brush
 3 units equal the remaining book depreciation for the Brush units between the
 4 years 2023 and 2028.

5 Q. ARE THE REPLACEMENT POWER TAIL PRICING ASSUMPTIONS THE
 6 MAIN DRIVER OF THIS RESULT?

7 A. No. The main driver is that customers save money by the Company owning the
 8 units compared to continuing with the existing PPAs. These savings were
 9 presented in Table JFH-2 of my Direct testimony in the Brush Docket and were

1 shown to be \$11.3 million. The replacement power prices only come into play
2 when the PPA for the 90 MW of capacity of Brush units 1 &3 expires in 2017.
3 The replacement power prices for Brush 4 really don't come into play until 2023
4 since the existing Brush 4 PPA runs into 2022.

5 **Q. WHAT DO YOU CONCLUDE FROM THIS ASSESSMENT?**

6 A. In summary, to the extent that there is any uncertainty about whether the Brush
7 units will reach their full remaining useful lives as estimated by Public Service
8 (22, 31, and 34 years for Brush Units 1, 3, and 4D respectively) the Brush
9 acquisition is a good deal for our customers under a greenfield replacement
10 power scenario so long as the units remain in-service through 2023 (11 years).
11 Even under a brownfield replacement power scenario, the Brush units only need
12 to remain in service 16 years (until 2028) for our customers to break-even. After
13 those dates, every additional year creates net savings for our customers. Mr.
14 Hess explains why we have confidence that it is likely that the Brush units will
15 provide service to us after these cross-over dates.

16 **IV. THE IMPLICATIONS OF THE ARAPAHOE 4 APPLICATION ON**

17 **CHEROKEE 4**

18 **Q. CIEA, WRA, AND INTERWEST ADVOCATE THAT ALTERNATIVES TO**
19 **BURNING GAS IN CHEROKEE 4 BE EXAMINED USING THE STRATEGIST**
20 **MODEL RATHER THAN THE SPREADSHEET APPROACH PROPOSED BY**
21 **THE COMPANY. HAS THE COMPANY RECONSIDERED ITS POSITION ON**
22 **THIS MATTER?**

1 A. Yes. The spreadsheet model was proposed by the Company in response to
2 requests in prior proceedings for easier to review analyses from the bid
3 evaluation process. The Company agrees with the parties that the Strategist
4 analyses provide more complete comparisons of the costs and benefits of
5 various resources. The answer testimony of the parties now indicates a
6 preference for using the Strategist model in evaluating potential alternatives to
7 burning gas in Cherokee 4 as the Company did in evaluating alternatives to
8 burning gas in Arapahoe 4. The Company is not opposed to using Strategist in
9 the evaluation of alternatives to burning gas in Cherokee 4 in the Phase 2
10 process and will do so.

11 **Q. DOES THE COMPANY'S OFFER TO USE STRATEGIST IN THE PHASE 2**
12 **EVALUATION OF CHEROKEE 4 ALSO INCLUDE AN OFFER TO ALLOW ALL**
13 **TECHNOLOGIES TO COMPETE WITH CHEROKEE 4?**

14 A. Yes. The Company's original proposal regarding the analysis of alternatives to
15 Arapahoe 4 and Cherokee 4 operating on gas was discussed on page 1-51 of
16 ERP Volume 1 and included: 1) performing the spreadsheet analysis of
17 alternatives prior to the computer modeling of bid portfolios, 2) allowing only
18 existing dispatchable gas-fired facilities to compete against the existing Cherokee
19 4 unit on gas, and, 3) requiring any individual bid or group of bids to offer
20 approximately 352 MW of firm generation capacity starting during the RAP and
21 ending 12/31/2025. The Company is willing to eliminate these conditions.

1 However, we will only be able to select an alternative that meets or exceeds the
2 emission reductions achieved by fuel switching Cherokee 4 to gas.

3 **Q. HOW WOULD ARAPAHOE 4 BE TREATED IN THESE PHASE 2 ANALYSES**
4 **IF THE COMMISSION WERE TO DENY THE COMPANY'S PENDING**
5 **APPLICATION TO RETIRE ARAPAHOE 4 AND REPLACE IT WITH THE**
6 **SOUTHWEST GEN PPA?**

7 A. If the Commission denies our application to retire early Arapahoe 4 and contract
8 with Southwest Generation, then the Company will reinstate our plan to operate
9 Arapahoe 4 on gas from 2014 -2023 and will examine alternatives to burning gas
10 in Arapahoe 4 in Phase 2 in the same manner as discussed above for Cherokee
11 4.

12 **Q. CAN YOU EXPLAIN IN MORE DETAIL HOW THE COMPANY WOULD**
13 **EVALUATE ALTERNATIVES TO ARAPAHOE 4 AND CHEROKEE 4**
14 **RUNNING ON GAS IN PHASE 2?**

15 A. Portfolios of bids would be developed for the case in which the Company
16 continues to operate both the Arapahoe 4 and Cherokee 4 generating units on
17 gas from 2014-2023 and 2018-2028 respectively. Portfolios of bids would also be
18 developed for three other cases: 1) Arapahoe 4 retired 1/1/2014; 2) Cherokee 4
19 retired 1/1/2018; and both Arapahoe 4 and Cherokee 4 retired 1/1/2014 and
20 1/1/2028, respectively. By comparing the costs of these four sets of portfolios the
21 Company will be able to determine if a more cost-effective alternative to burning
22 gas in these units is available from the bid pool.

1 **Q. WRA AND INTERWEST ADVOCATE THAT THE COMMISSION APPROVE**
2 **EARLY RETIREMENT OF ARAPAHOE 4 IN PHASE 1 BUT THAT THE**
3 **COMMISSION NOT APPROVE THE SOUTHWEST GENERATION**
4 **CONTRACTS. THESE PARTIES SUGGEST INSTEAD THAT THE**
5 **ADDITIONAL MW NEED CREATED BY ARAPAHOE 4 RETIRMENT BE**
6 **FILLED IN THE PHASE 2 PROCESS. IS THIS A GOOD IDEA?**

7 A. No. As Mr. Haeger testifies in his supplemental rebuttal testimony, it is important
8 to keep our low cost Arapahoe 4 unit as a competitive option in order to ensure
9 others will have to bid against that low cost option and not just each other in
10 order to get the lowest priced bids for replacement power. A decision to retire
11 Arapahoe 4 prior to knowing the cost of the replacement power is not in the best
12 interest of our customers.

13 **Q. DOES THE COMPANY VIEW THE LIMITED FLEXIBILITY THAT WILL COME**
14 **WITH OPERATING ARAPAHOE 4 AND CHEROKEE 4 ON GAS AS EITHER A**
15 **PROBLEM OR A CONCERN?**

16 A. No. Contrary to both Mr. Monsen's supplemental answer testimony page 25
17 reference to this limited flexibility as being a "problem" for Arapahoe 4 and Ms.
18 Farnsworth's supplemental answer testimony page 6 references to this limited
19 flexibility as a "concern" for both Arapahoe 4 and Cherokee 4, the Company is
20 not concerned about operating these units on gas nor do we view any limitations
21 associated with such operation as a problem. With both Arapahoe 4 and
22 Cherokee 4 operating on gas, the remainder of our supply fleet contains a

1 sufficient amount of flexible generation (both owned and purchased) to ensure
2 continued reliable operation of the system throughout the Resource Acquisition
3 Period⁷. As a result, the Company does not need to replace either the 109 MW
4 of Arapahoe 4 or the 352 MW of Cherokee 4 with more flexible generation.

5 **Q. BUT AREN'T ARAPAHOE 4 AND CHEROKEE 4 INEFFICIENT WHEN**
6 **OPERATED ON GAS?**

7 A. It depends on to what they are being compared. The heat rate of both units is
8 expected to increase approximately 4% when operated on gas compared to the
9 heat rate when operating on coal. That corresponds to a full load gas heat rate
10 of approximately 11,500 btu/kWh for Arapahoe 4 on gas and, 10,500 btu/kWh for
11 Cherokee 4 on gas. The Company has several existing gas-fired CTs on its
12 system (both owned and purchased) with heat rates at or higher than these.
13 Given that when operating on gas Arapahoe 4 and Cherokee 4 are expected to
14 run at low annual capacity factors (less that 2%), fuel costs that result from the
15 units heat rates are expected to be insignificant.

16 **Q. WHY THEN IS THE COMPANY REQUESTING THAT ARAPAHOE 4 BE**
17 **RETIRED AND THE END OF 2013 AND BE REPLACED WITH THE NEW**
18 **SOUTHWEST GEN PPA?**

19 A. As Mr. Haeger describes in his supplemental rebuttal testimony, we asked
20 owners of existing IPP facilities who were in a position to potentially compete with
21 Arapahoe 4 to provide us with whatever value they could to create customer

⁷ See the July 16, 2012 rebuttal testimony of Mr. Bartlett and Mr. Hill.

1 savings by retiring Arapahoe 4. Southwest Gen was able to provide value by
2 agreeing to the GSA.

3 **V. STRATEGIST MODELING OF ARAPAHOE 4 ALTERNATIVES**

4 **Q. MS. PODEIN EXPRESSES SOME CONCERNS WITH RESPECT TO THE**
5 **STRATEGIST MODELING OF THE CASES YOU PRESENTED TO EVALUATE**
6 **ALTERNATIVES TO ARAPAHOE 4. WOULD YOU PLEASE SUMMARIZE HER**
7 **CONCERNS?**

8 A. On page 17 of her supplemental answer testimony, Ms. Podein discusses how
9 in Case 3 Strategist added two RAP CTs in 2018 instead of adding one RAP CT
10 in 2018 and one Greenfield CT in 2019. She goes on to state that the addition of
11 two RAP CTs in 2018 when one would have been sufficient (with the second
12 being added in 2019) represents an inconsistency that places into question the
13 reliability of the Strategist model results regarding alternatives to Arapahoe 4.

14 **Q. IS THERE AN EXPLANATION AS TO WHY STRATEGIST ELECTED TO ADD**
15 **TWO RAP CTS IN 2018?**

16 A. Yes. Ms. Podein's supplemental answer testimony Table 5, illustrates how Case
17 3 required that four of the generic CTs be added between 2017 and 2019 in
18 order to meet the Company's reserve margin targets of 16.3%. This can be seen
19 in Case 3 showing ~ 70 MW of excess generation capacity in 2019 and
20 recognizing that if one were to remove one of the 173 MW RAP CTs from year
21 2018, year 2019 would go from being 70 MW long on capacity to being 103 MW
22 deficient on capacity. The model was therefore faced with the choice of adding

1 either two RAP CTs in 2018 and zero in 2019 or, one RAP CT in 2018 and one
2 Greenfield CT in 2019. Note that consistent with how the alternative plans were
3 modeled in ERP Volume 1, RAP CTs were only available for Strategist to choose
4 from during the 2012-2018 RAP. For years beyond the RAP, Greenfield CTs
5 were available for Strategist to choose from. Furthermore, the RAP CT is lower
6 cost than the Greenfield CT which reflects the expectation that bidders may try to
7 price PPA bids below the cost of new greenfield units. Finally, the RAP CT offers
8 lower pricing through economies of scale if two units are constructed as
9 compared to constructing only one. Given these representations, Strategist
10 made the correct economic decision to construct two RAP CTs in 2018 versus a
11 single RAP CT in 2018 and a single Greenfield CT in 2019. While this choice
12 may have appeared to Staff as being inconsistent with the MW needs in 2018,
13 the choice was correct based on the alternatives from which Strategist could
14 choose.

15 **VI. INTERWEST CRITICISMS OF ARAPAHOE 4 ANALYSIS**

16 **Q. MR. COX TAKES THE POSITION THAT A FULL AND FAIR ANALYSIS OF**
17 **ALTERNATIVES TO ARAPAHOE 4 CAN ONLY BE ACHIEVED IN THE**
18 **PHASE 2 COMPETITIVE BIDDING PROCESS. UPON WHAT IS HIS**
19 **POSTION BASED?**

20 **A.** From reading his testimony Mr. Cox appears to take this position based on the
21 fact that the Company did not consider whether additional renewable resources
22 such as new wind and new solar generation could serve as lower cost

1 alternatives to Arapahoe 4 than the Southwest Gen contracts the Company is
2 proposing.

3 **Q. IS THERE A REASON TO BELIEVE THAT HAD THE COMPANY**
4 **CONSIDERED ADDITIONAL WIND AND SOLAR GENERATION WITHIN THE**
5 **ANALYSIS OF ARAPAHOE ALTERNATIVES THAT INCLUSION OF THESE**
6 **RESOURCES COULD PROVIDE MORE SAVINGS THAN THE \$18 MILLION**
7 **SAVINGS THE SOUTHWEST GEN CONTRACTS ARE ESTIMATED TO**
8 **PROVIDE?**

9 A. I don't believe this is a reasonable conclusion. Remember that the Company's
10 proposal was to burn gas in Arapahoe 4 for the ten year period from 2014-2023.
11 I don't believe that wind and solar developers would offer the Company a PPA
12 with a new wind or solar facility with a term that ends in year 2023. It has been
13 my experience that these developers would seek 20-25 year PPA terms.
14 Furthermore, the Alternative Plan analysis that was discussed in Section 1.5 of
15 ERP Volume I and Section 2.8 of ERP Volume II provide information as to
16 whether additional wind and solar PV can be expected to be cost-effective
17 additions to the Public Service system. More specifically, Figure 2.8-8 on page
18 2-244 of ERP Volume II shows how the addition of 200 MW of wind in 2016,
19 adds cost to the system for all years from 2016-2023. Similarly, Figure 2.8-10 on
20 page 2-246 shows how the addition of 200 MW of wind and 25 MW of solar PV
21 add cost to the system for years 2016-2023. For these reasons I don't think that
22 when we were doing this evaluation in the spring of 2012, allowing wind and

1 solar developers to offer alternatives to burning gas in Arapahoe 4 would have
2 produced additional savings above the bid we received from Southwest Gen.

3 **Q. WILL COMMISSION APPROVAL IN PHASE 1 OF THE COMPANY'S**
4 **APRAPAHOE PROPOSAL PRECLUDE WIND AND SOLAR BIDS THE**
5 **OPPORTUNITY TO PROVIDE ADDITIONAL VALUE TO THE SYSTEM IN THE**
6 **PHASE 2 PROCESS?**

7 A. I don't believe so. The Company is proposing that the Phase 2 competitive
8 solicitation process involve an All-Source RFP in which all generation
9 technologies (including wind and solar) will be allowed to bid. The Phase 2
10 process will also consider the economics of bids over the full term of their
11 proposed PPA terms. So to the extent wind and or solar bids offering 20 or 25
12 year PPAs are shown to provide additional savings to the system above those
13 provided with the Southwest Gen Arapahoe proposal, those savings will show up
14 in the Phase 2 bid evaluation even if the Commission approves the Company's
15 Arapahoe proposal in Phase 1.

16 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

17 A. Yes.