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 AN AMENDMENT TO ITS) Docket No. 10A-377E
2007 COLORADO RESOURCE PLAN)
)

DIRECT TESTIMONY AND EXHIBITS OF JAMES F. HILL

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

June 4, 2010

LIST OF EXHIBITS

Exhibit No. JFH-1	Public Version - Amendment to the 2007 Colorado Resource Plan
Confidential Exhibit No. JFH-1	Confidential Version - Amendment to the Colorado Resource Plan

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DIRECT TESTIMONY AND EXHIBITS OF JAMES F. HILL

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is James F. Hill. My business address is 550 Fifteenth Street, Suite 1000, Denver, Colorado 80202.

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

A. I am employed by Xcel Energy Services, Inc., a wholly-owned subsidiary of Xcel Energy Inc., the parent company of Public Service Company of Colorado. My title is Director, Resource Planning and Bidding.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THE PROCEEDING?

A. I am testifying on behalf of Public Service Company of Colorado ("Public Service" or the "Company").

Q. HAVE YOU INCLUDED A DESCRIPTION OF YOUR QUALIFICATIONS, DUTIES, AND RESPONSIBILITIES?

A. Yes. A description of my qualifications, duties, and responsibilities is included as Attachment A.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my testimony is to summarize the key aspects of the Company's application to amend our approved 2007 CRP and to sponsor this application before the Commission. The 2007 CRP amendment report is included as Exhibit No. JFH-1 to my testimony. There are two versions of Exhibit No. JFH-1 – a Public Version and a Confidential Version. We needed to protect certain Confidential Information to protect the Company's ability to bargain for the good low prices of solar energy.

Q. WHAT ASPECTS OF THE 2007 CRP DOES THE COMPANY SEEK TO AMEND WITH THIS APPLICATION?

A. The Company is seeking 1) Commission approval to reduce the amount of solar generation it targets to acquire from 2009 All-Source bids from the 355 MW level contained in Portfolio 5 of the Company's 120-day report (105 MW of PV and 250 MW of solar with storage) to no more than 185 MW, which represents the amount of additional generation capacity[1] that can be added in the San Luis Valley (SLV) and accommodated using firm transmission service from the existing[2] SLV transmission system, 2) a Commission finding that given the current transmission limitations in the

[1] In addition to the existing 7 MW SunE facility and the 18 MW Sandhills facility currently under construction.

[2] Relatively minor upgrades to the San Luis Valley to Poncha 115 kV line are needed to allow 185 MW of additional generation capacity to be added in the SLV.

SLV it is not prudent to fill the entire 200 MW set-aside for solar thermal with thermal energy storage in this resource plan from 2009 All-Source bids located in the SLV, and 3) a Commission finding that the Company does not need to invoke a contingency plan to replace the solar generation capacity from Portfolio 5 that will not be acquired in this resource plan.

In addition, the Company is seeking guidance from the Commission regarding their Phase II decision to have the Company pursue bids for solar thermal with storage. The Company believes that changed circumstances regarding the underlying economic factors that formed the basis for that original decision warrant reconsideration.

Q. WHAT CIRCUMSTANCES LED THE COMPANY TO SEEK A LIMIT ON THE TARGETED AMOUNT OF SLV SOLAR BIDS TO 185 MW?

A. We are seeking this amendment due to the anticipated delays in obtaining the necessary approvals for the proposed SLV-Calumet-Comanche transmission project, through 1) the CPCN process, 2) the Rural Utility Service review and approval process, and 3) subsequent project route permitting. The combined effect of these delays is that the line will not be completed by summer 2013 as originally projected, but instead we project the line to be in-service by the spring of 2015.

Q. HOW DOES A SPRING 2015 IN-SERVICE DATE FOR THE SLV-CALUMET-COMANCHE TRANSMISISON PROJECT FACTOR INTO

THE AMOUNT OF SOLAR GENERATION THE COMPANY ELECTS TO PURSUE FROM 2009 ALL-SOURCE BIDS?

A. Until this transmission project or others are constructed, insufficient firm transmission export capability will exist in the SLV to accommodate more than approximately 185 MW of additional solar generation capacity. All of the bids (both from the PV pool and the lowest cost solar with storage bid) under consideration for meeting the ~355 MW solar acquisition target proposed in-service dates well in advance of spring 2015. Solar generating capacity operating in the SLV in excess of the Company's firm transmission rights (approximately 170 MW in this instance 355-185) would be subject to having their electrical output curtailed. Under the terms of the model purchase power agreement, the Company would be responsible for paying solar developers for the curtailed energy at the same $/MWh rate as that which is paid for energy that is delivered to customers. The fact that these curtailment payments would be passed on to customers, coupled with the relatively high cost of solar generation (i.e., in an approximate range of $140-$190/MWh), the Company believes that pursuing a level of solar generation from the 2009 All-Source RFP in excess of our 185 MW of remaining firm transmission rights could pose an undue cost risk to customers.[3]

[3] As an example, if $150/MWh solar generation were curtailed and replaced with $70/MWh gas-fired generation, customers would be charged $150/MWh + $70/MWh = $220/MWh.

Q. HOW DOES LIMITING THE AMOUNT OF SOLAR ACQUIRED FROM 2009 ALL-SOURCE BIDS TO NO MORE THAN 185 MW IMPACT THE ABILITY TO MEET THE 200 MW SET-ASIDE FOR SOLAR TECHNOLOGIES WITH STORAGE?

A. The only bids received in the 2009 All-Source RFP for solar thermal with storage were located inside the San Luis Valley. Therefore all options to fulfill the 200 MW set-aside for this Section 123 technology would result in solar generation capacity in the Valley in excess of the Company's 185 MW firm transmission rights.

Q. WHAT IS THE BASIS FOR REQUESTING A COMMISSION FINDING THAT THE COMPANY DOES NOT NEED TO INVOKE A CONTINGENCY PLAN TO REPLACE THE SOLAR GENERATION CAPACITY FROM PORTFOLIO 5 THAT WILL NOT BE ACQUIRED IN THIS RESOURCE PLAN?

A. A contingency plan would be warranted if there was a reliability concern that acquiring less than the full 355 MW of solar generation capacity from Portfolio 5 could result in a material risk that the Company could not maintain electric service to our firm customers. An updated analysis of the Company's loads and resources, using the current demand forecast, shows that acquisition of 185 MW of solar capacity by the summer of 2014 would result in 75 MW of excess capacity by year 2015 above what is needed to meet a 16.3% planning reserve margin target. This same

loads and resource analysis also shows that if the Company were to acquire as little as 60 MW of PV bids (one of the options discussed later in my testimony) we would still be only 50 MW short of meeting the 16.3% base planning reserve margin. The Company believes that this 50 MW level of shortfall does not present a reliability concern and could easily be met by a number of options, including additional summer capability from the newly constructed Comanche 3 facility,[4] deploying additional cost-effective DSM measures, and/or short-term market purchases of additional generation capacity. The Commission's Resource Planning rules allow all of these options to be pursued outside of a competitive acquisition process.

Q. IS THE COMPANY STILL PURSUING A LEVEL OF WIND AND GAS-FIRED GENERATION CONSISTENT WITH THOSE CONTAINED IN PORTFOLIO 5?

A. Yes. With regard to the 701 MW of wind resources contained in Portfolio 5, the Company has completed contract negotiations with two of the three winning wind bidders. Negotiations with the third winning wind bidder are progressing well. As for the winning gas-fired bid from Portfolio 5, the Company has completed negotiations with this bidder for the purchase of

[4] The Comanche 3 facility appears to be capable of providing 30-50 MW more output during summer peak day conditions than the 750 MW that was assumed in the analysis of loads and resources discussed above. PSCo's share of this extra capacity would be 66% or approximately 20 – 33 MW.

approximately 960 MW of gas-fired generation capacity and has filed for Commission approval of that transaction.

Q. PLEASE ELABORATE ON THE COMPANY'S REQUEST FOR GUIDANCE FROM THE COMMISSION REGARDING THEIR PHASE II DECISION TO HAVE THE COMPANY PURSUE BIDS FOR SOLAR THERMAL WITH STORAGE.

A. As discussed in the Exhibit No. JFH-1 report, the Company believes that the increased price for the solar thermal with storage bid, coupled with falling gas prices and the expectation that carbon legislation won't be enacted for several years, act in concert to erode the economics of solar thermal with storage relative to combined-cycle gas generation, such that the Company can no longer assert that the solar thermal with storage bid price is reasonable relative to combined-cycle gas bids. Therefore the Company is asking the Commission to consider whether these changed circumstances alter their initial Phase II finding that the Section 123 project was in the public interest.

Q. WHAT OPTIONS FOR ACQUIRING UP TO 185 MW OF SOLAR GENERATION HAS THE COMPANY PRESENTED FOR COMMISSION CONSIDERATION?

A. The Company offers three outcomes for the Commission to consider:

1. Continue pursing the acquisition of the 125 MW solar thermal with storage bid along with two 30 MW solar PV bids for a total solar acquisition of 185 MW.
2. Terminate contract negotiations with the 125 MW solar thermal with storage bidder, continuing pursuing the two 30 MW solar PV bids and begin pursing an additional 30 MW solar PV bid for a total solar acquisition of 90 MW all within the San Luis Valley.
3. Delay the acquisition of additional solar resources above 60 MW of solar PV until the Phase II acquisition process that will result from the 2011 Resource Plan filing.

Q. IS THE COMPANY'S REQUEST TO LIMIT THE ACQUSITION OF SOLAR BIDS FROM THE 2009 ALL-SOURCE TO NO MORE THAN 185 MW AN INDICATION THAT THERE IS NO LONGER A NEED FOR THE PROPOSED SAN LUIS VALLEY – CALUMET - COMANCHE TRANSMISSION PROJECT?

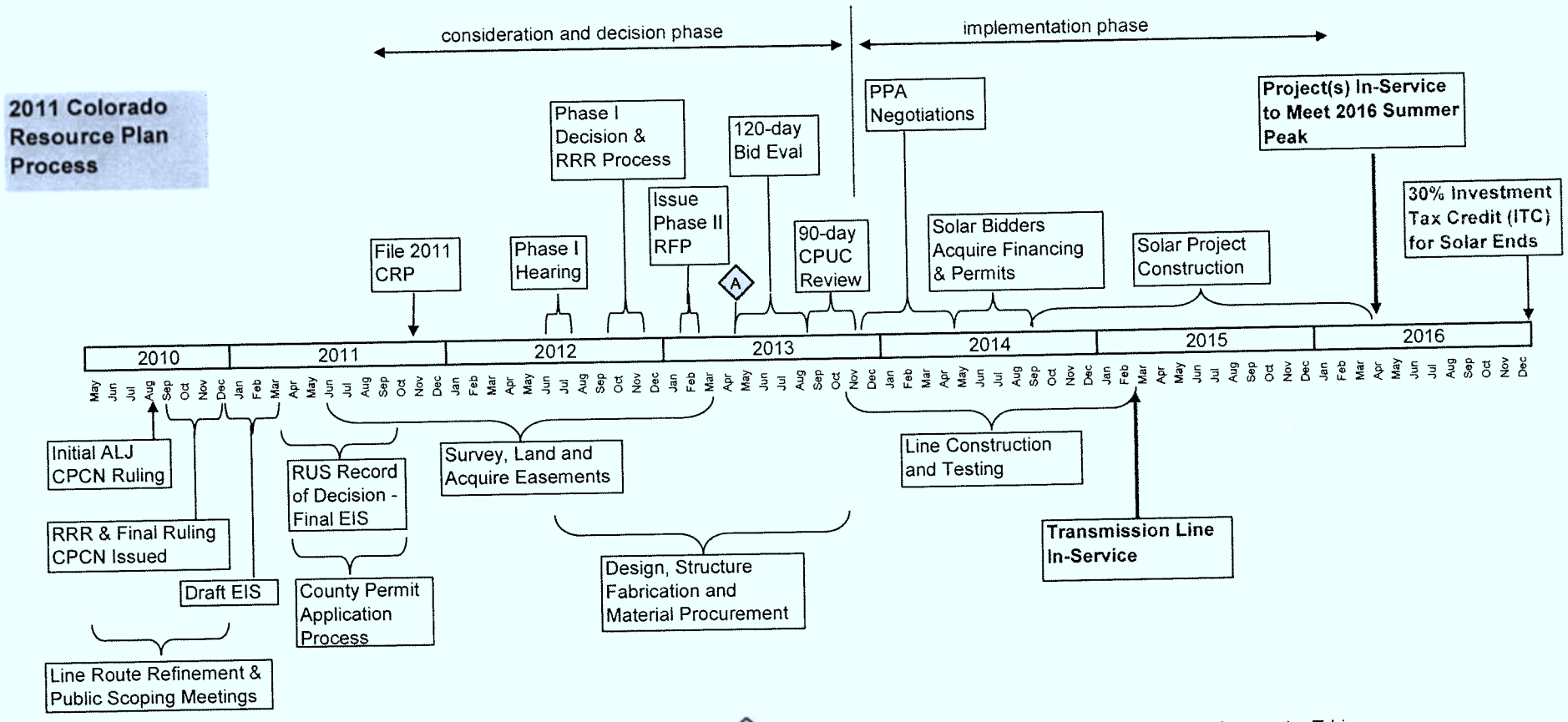
A. No. The Company remains committed to further expansion of solar generation resources in the San Luis Valley and is committed to completing the San Luis Valley-Calumet-Comanche transmission project. The Company will file its next resource plan by October 2011. If that resource plan follows a similar schedule as that of the 2007 resource plan, the Company will be acquiring resources in early 2013. The Company urges the Commission to continue to diligently consider the CPCN for this

transmission project so that while the Company is assessing which resources to pursue in the 2011 resource plan, we are not in the same position that we find ourselves in today -- not being able to commit to solar expansion from Energy Resource Zone 4 (the State's premier solar resource zone) because of lack of certainty regarding the ability to export solar generation from the transmission constrained San Luis Valley. Figure JFH-1 provides general timelines for the 2011 CRP and the activities associated with developing the San Luis Valley-Calumet-Comanche transmission line following receipt of a CPCN. The figure shows that for bidders to offer, and for Public Service to consider, additional solar projects in the San Luis Valley in the 2011 CRP, by the spring of 2013 there needs to be certainty that all easements and permits have been obtained to construct the line. To ensure that this level of certainty can be provided by the spring of 2013, the Company believes the CPCN needs to be issued by the fall of 2010.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes.

Figure JFH-1



A Key date for having certainty that the SLV-Calumet-Comanche T-Line has obtained all permits and acquired all easements needed to construct. Absent this certainty, PSCo believes bidders of SLV solar projects will be hesitant to put forth the time and effort to develop viable projects to bid into an All-Source RFP. In addition, absent this certainty, PSCo will not propose additional solar resources in the portfolios presented for Commission consideration in the 120-day report.

Attachment A

Statement Of Qualifications

James F. Hill

I graduated from Colorado State University in 1983 with a Bachelor of Science degree in Natural Resource Management and in 1995 from the University of Colorado with a Bachelor of Science degree in Mechanical Engineering.

I have been employed by Public Service Company of Colorado, New Century Services, Inc., and now Xcel Energies Services Inc. for 26 years. I began my employment in 1984 at Public Service Company of Colorado's Fort St. Vrain Nuclear Generating Station in the Technical Services and Licensing Department. In August 1992, I joined Public Service Company of Colorado's System Planning Department where I performed resource planning functions, as a Planning Engineer, a Senior Resource Planning Analyst, Manager of Resource Planning and Bidding and now Director of Resource Planning and Bidding with a focus on Public Service Company of Colorado.

As the Director of the Resource Planning and Bidding Group, I have responsibility for overseeing the Company competitive resource acquisition processes as well as the various technical analyses on the resource options that are available to Xcel Energy's operating companies for meeting customer demand.

I have testified before the Colorado Public Utilities Commission regarding electric resource planning issues in numerous dockets.

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Exhibit No. JFH-1

PUBLIC

Public Service Company of Colorado

Amendment to the 2007 Colorado Resource Plan

June 2010

Public Version
Exhibit No. JFH-1

Public Service Company of Colorado
2007 CRP Amendment - June 2010

Part I: Executive Summary

In Decision No.C09-1257, the Commission directed the Company to target the acquisition of a portfolio of resources (Portfolio 5) to meet its 2008-2015 resource needs that contained 250 MW of concentrating solar thermal with energy storage and 105 MW of photovoltaic resources (as well as targets for wind and gas) for a total solar generation portfolio of up to 355 MW. The acquisition of the solar resources contained in Portfolio 5 was predicated on the Company constructing additional transmission capacity out of the San Luis Valley ("SLV"), the best solar Energy Resource Zone ("ERZ") in the state. In May 2009, Public Service and Tri-Sate Generation and Transmission filed applications with the Commission for a Certificate of Public Convenience and Necessity ("CPCN") to construct a new transmission project (the "SLV-Calumet-Comanche Transmission Project" or "transmission project") designed to address reliability concerns in the San Luis Valley and Walsenburg areas and to access wind and solar generation from ERZs 4 and 5. During the ensuing proceeding, it has become apparent that the timing to obtain the necessary approvals for the transmission project, through the CPCN process, the Rural Utility Service approval process, and subsequent route permitting will likely mean that the line will not be completed by 2013. As a result of the uncertainty of the timing of the receipt of the necessary approvals to construct the proposed transmission project, proceeding to acquire the full 355 MW of solar resources identified in Portfolio 5 could require curtailing a portion of the output of solar generators located in the SLV. The potential financial impact to customers of such curtailments means that it is no longer in the public interest for the Company to acquire the full 355 MW of solar identified in Portfolio 5.

The Company seeks Commission approval to amend the resource plan as follows:

1. It is prudent to limit the solar acquired in this resource planning cycle to the amount that can be accommodated using the existing transmission system in the San Luis Valley – this would mean that the Company would execute purchased power contracts for no more than approximately 185 MW of solar generation,
2. It was not possible to fill the entire 200 MW set-aside for solar thermal with thermal energy storage in this resource plan from 2009 All-Source bids, and
3. The Company does not need to invoke a contingency plan at this point to replace the solar generation capacity from Portfolio 5 that will not be acquired in this resource plan.

In addition, as a result of a recent proposed price increase of the solar thermal with thermal energy storage project and changes in the underlying economic factors that formed the basis for the original approval of this Section 123 resource, the Company seeks Commission consideration of whether these conditions warrant reconsideration of that decision. The Company offers three paths for the Commission to consider – one in which the solar thermal with storage project moves forward at 125 MW and two alternative paths should the Commission determine that it cannot reaffirm its original decision that this Section 123 resource is cost-effective.

Part II: Background

Commission Approved Resource Portfolio

In its 120-Day Report filed with the CPUC in August 2009, the Company detailed the generation resource components of its preferred portfolio, which included:

- 921 MW of gas-fired resources,
- 701 MW of wind resources,
- 250 MW of solar thermal with thermal storage resources, and
- 60 MW of photovoltaic resources.

Although each portfolio presented to the Commission contained specific PV projects, the Company proposed that continued competition among the lowest cost PV bids (the "PV pool" concept) would provide substantial benefits to its customers.

In CPUC Decision C09-1257, the Commission approved the Company's targeted acquisition of concentrating solar thermal with energy storage and the Company's plan to acquire PV resources through the PV pool concept. While indicating that the ultimate target level of PV resources acquired from the pool could be "adjusted to accommodate changes in bids or bid sizes, or prices, or other factors"[1], the Commission directed the Company to target 105 MW of PV resources as represented by Portfolio 5 instead of 60 MW as contained in the Company's preferred portfolio. The components of Portfolio 5 are as follows,

- 921 MW of gas-fired resources,
- 701 MW of wind resources,
- 250 MW of solar thermal with thermal storage resources, and
- 105 MW of photovoltaic resources.

San Luis Valley-Calumet-Comanche Transmission Project

In May 2009, Public Service and Tri-Sate Generation and Transmission ("Tri-State") filed applications with the Commission for a CPCN to construct the SLV–Calumet–Comanche Transmission Project. The Companies proposed to construct a transmission project from the SLV to Calumet to Comanche and to construct a line connecting the existing Walsenburg substation with the new Calumet substation. The Commission determined that the CPCN application did not qualify for expedited consideration under the SB07-100 process. In addition, the CPCN application has proven quite contentious thus extending the time period for consideration of the application. At the same time, the Rural Utilities Service, a federal government agency to whom Tri-State has applied to secure a loan to construct the project, has determined that the line warrants an environmental impact statement ("EIS") rather than an environmental assessment. Preparation of the EIS will add some time to the overall approval process. Recently the record in the CPCN case was reopened to receive evidence of the impact, if any, of HB10-1001 (30% RES) on this application, resulting in further extension of the timeline for CPCN approval. Finally, after the CPCN is granted, the Companies still need additional local land use permits for the route chosen for the transmission facility.

[1] CPUC Decision C09-1257, page 24, paragraph 60.

Portfolio 5 was the portfolio preferred by the Commission based in part on the underlying assumption that sufficient transmission capacity would be available to deliver the approved solar projects' electric output to load. At this point, it appears likely that the proposed transmission project will not be in-service by summer 2013 as originally estimated and therefore reconsideration of the solar generation aspects of the plan is warranted.

Risk of Insufficient Transmission Capacity

In the 2007 resource planning process, the Commission approved the acquisition of resources, including the solar PV and concentrating solar thermal with energy storage generation resources that are the subject of this application, through a process in which bids were solicited against the terms of a model purchased power agreement ("PPA"). When the 2009 All-Source Solicitation was issued in early 2009, four separate Requests for Proposals were issued, each seeking a specific generation type and each including a model Purchase Power Agreement (PPA) tailored to the specific type of generation sought. Bidders submitted prices to build generators and sell the output to the Company under the terms of those model PPAs. Solar PV projects bid to the Model Solar Energy PPA and solar thermal with thermal energy storage projects bid to the Semi-Dispatchable Renewable Capacity Resources PPA. Both of these model PPAs included a provision stating that if Public Service elected to use non-firm transmission to deliver the power from the solar generator to load, Public Service would be responsible to pay the bidder for the solar energy that was not able to be delivered to load in the event that the non-firm transmission was curtailed.[2] Specifically, Section 8.7 of the "Model PPA for Semi-Dispatchable Renewable Capacity Resources" states:

> "(A) If (i) delivery of Solar Energy is curtailed by Company pursuant to Section 7.6, or as a result of AGC control of the Facility, or (ii) Company elects to utilize non-firm transmission service(s) to deliver Solar Energy from the Point of Delivery to Company load, and deliveries of Solar Energy to Company are curtailed as a result of the curtailment of such non-firm transmission service(s) by the Interconnection Provider, then
>
> (1) based upon the Facility's dispatch schedule for the day and the actual meteorological conditions, the Parties shall determine the expected quantity, expected hour of delivery, and Seller's expected payment for Solar Energy that would have been produced by the Facility and delivered to the Point of Delivery had its generation not been so curtailed,
>
> (2) based upon the Facility's actual dispatch following the end of the curtailment, the Parties shall determine the actual payment for Solar Energy produced by the Facility and delivered to the Point of Delivery as a result of the Seller's prudent utilization of the Facility's energy storage technology to maximize the amount of stored energy during the curtailment, and
>
> (3) Company shall pay to Seller the difference in Solar Energy payments calculated in Section 8.7(A)(1) and Section 8.7(A)(2)) above.

[2] See Section 8.2 of the Model Solar Energy PPA and Section 8.7 of the Model PPA for Semi-Dispatchable Capacity Resources, which were part of the 2009 All-Source RFP bid package.

(B) Notwithstanding anything in this Article 8 to the contrary, no payment shall be due Seller under paragraph (A) above for curtailments of delivery of Solar Energy resulting from:

(1) an Emergency;

(2) any action taken by the Interconnection Provider under the LGIA;

(3) any curtailment of firm transmission service by the applicable transmission service provider, arranged by either Party, to provide delivery of Solar Energy to or from the Point of Delivery; or

(4) any curtailment arising from Seller's failure to maintain in full force and effect any permit, consent, license, approval, or authorization from any Governmental Authority required by law to construct and/or operate the Facility."

Public Service has found from its past experience with solicitations for renewable resources that in order to attract bidders, curtailment provisions of this type must be offered. The owners of renewable resources are paid only for energy produced due to the intermittent nature of their facilities and, while willing to assume the risk of their generator's performance, these bidders are not willing to assume the risks inherent with the use of non-firm transmission. The Commission approved similar curtailment contract clauses and recovery by Public Service of curtailment payments in Decision No. C04-0994 (August 24, 2004) in Docket No. 04A-325E.

In Docket No. 04A-325E, the Commission required Public Service to take into account the likely curtailment costs due to non-firm transmission when evaluating the renewable resources bid against one another. The cost of both the purchased energy and any curtailment payments were to be passed to ratepayers through the ECA. Now, after the passage of Amendment 37 and the development of the Commission's Renewable Energy Standard Rules, curtailment payments would likely be recovered in either the ECA or the RESA or both.

In the 2009 All Source solicitation, Public Service used our standard curtailment provisions in the model contracts for all of the solar resources. However, in the Company's portfolio evaluations, we assumed that the SLV—Calumet –Comanche Transmission Project would be constructed by summer 2013, and that the transmission used to access projects in the San Luis Valley would be firm transmission, not non-firm transmission. As a consequence, no curtailment payments were assumed in the evaluation of solar resources in the San Luis Valley. Now that it appears there will be a delay in the in-service date of the Transmission Project, the potential curtailment payment liability could be quite large if the Company were to contract for all the resources assumed in Portfolio 5. The Company believes that pursuing a level of solar generation from this 2009 All-Source RFP in excess of our firm transmission rights can pose an undue cost risk to customers and is one of the main reasons that prompted the Company to return to the Commission to seek an amendment to our approved 2007 resource plan.

Part III: SLV Transmission Capacity

As stated in the CPCN application and testimonies, the San Luis Valley–Calumet–Comanche Transmission Project would allow interconnection of approximately 1500 MW of new generation resources, including renewable resources in ERZs 4 and 5 which include both the San

Luis Valley and Walsenburg areas. Although the CPCN was filed in May 2009, the Company does not expect a Commission order in the CPCN docket until the fall of 2010.

Both Tri-State and Public Service serve customer load in the San Luis Valley region today. The San Luis Valley customer loads are at the end of a radial transmission network that originates to the north, near Poncha Springs, Colorado. The network consists of only two parallel transmission lines: a 115 kV line and a 230 kV line. Public Service owns the 115 kV line, which was constructed in the 1950's. The 230 kV line is jointly owned between Public Service and Tri-State and was built in the early 1980's. Public Service's transmission studies indicate that the existing SLV transmission system can accommodate approximately 160 MW of generation in the San Luis Valley. The existing SunE Alamosa PV solar facility (7 MW AC) and the under-construction Greater Sandhills PV solar facility (18 MW AC) represent 25 MW of total solar generation already in the Valley.[3]

The amount of new resources that can be accommodated in the San Luis Valley can be determined by a simple calculation. First, the capability of the transmission network out of the area must be calculated. Based on transmission planning criteria, the system has to be able to withstand the loss of any single transmission element. Loss of the 230 kV line is the most severe single element outage. In that instance, the amount of power that can be transferred out of the area is whatever the remaining 115 kV line can handle, which is presently 125 MW[4].

Next, the portion of Valley generation that will act to serve Valley load must be calculated. An examination of the characteristics of customer load in the Valley was undertaken, which showed that minimum Valley load levels of approximately 60 MW exist during sunlight hours when solar generation in the Valley could be expected to be at or near full capacity. This effort involved an analysis of historical San Luis Valley load data (i.e., load served by both the Company and the rural electric coops)

Estimating the amount of new generation that can be added in the SLV is then estimated below by adding the capability (thermal rating) of the 115 kV line and the local load, and then subtracting out the existing SLV generation. The resulting estimate show the amount of additional generation in the Valley that could be supported by the existing SLV transmission system is approximately 160 MW.

Existing 115 kV line capability	125 MW
Minimum daytime load	+ 60 MW
SunE & Sandhills PV facilities	-25 MW
Headroom for additional generation	160 MW

[3] The two combustion turbines in the San Luis Valley owned by the Company (Alamosa 1 and 2) total 36 MW and are not included in Valley generation because these units can be dispatched around the non-dispatchable solar generation in real time. The Sandhills facility is under construction but is considered as 'existing generation' for purposes of this report

[4] Transmission lines are rated in units of MVA. For purposes of this report, line ratings are expressed in units of MW and at a level representative of typical system operation.

As a result of the delay in the SLV-Calumet-Comanche transmission project CPCN process, the Company's transmission planning and engineering group was asked to study the possibility of increasing the thermal capability of the San Luis to Poncha 115 kV line, which would in turn allow more than 160 MW of additional solar generation to be added in the Valley. The existing transmission system is limited by the rating of the 115 kV line between Sargent and Poncha. The Company has determined that the rating can be increased by approximately 30 MVA or 25 MW and could be completed in 18 months for a cost of approximately $2.2 million. Completion of this upgrade would increase the amount of additional generation that could be added in the Valley from 160 MW up to approximately 185 MW.

Uncertainty and delays regarding: 1) the date when a CPCN will be issued for the SLV-Calumet-Comanche line; 2) the date when the line would be in-service; and, 3) the associated potential curtailment payments to solar generation projects using non-firm transmission service, prompted the Company to seek, through this proposed plan amendment, Commission approval to limit the solar generation acquired through this resource plan to 185 MW to match the capability of the existing transmission system (with the aforementioned upgrade). Under this scenario, there could still be some curtailment of solar generation, for example, when the 230kV San Luis to Poncha line is out, load in the Valley is less than 60 MW, and solar generation is at full load. However, limiting the acquisition of solar projects to 185 MW at this time will limit the curtailment exposure customers would see compared to a scenario where the entire 355 MW of solar projects from Portfolio 5 were developed and the SLV-Calumet-Comanche project was not completed.

Part IV: Candidate Solar Bids for meeting a 185 MW Target

PV Bid Pool

On November 10, 2009, in accord with Commission Decision No CO9-1257, the Company contacted developers with proposed PV projects from the PV pool and requested Best and Final offers for their projects. The Company indicated to the developers that we were seeking to acquire roughly 100 MW of PV resources, that we preferred to acquire this targeted level through multiple projects instead of a single project, and we provided the bidders the ability to change their proposed project size(s), if desired. On December 9, 2009 Public Service received best and final proposals from the PV bid pool. From these proposals the Company selected four PV solar generating projects (SP03, SP06, SP19, SP20) totaling approximately 125 MW to enter into continued due diligence activities and potential contract negotiations. Only one of these four projects (30 MW SP03) was located outside the SLV. The remaining three 30-35 MW facilities were located inside the Valley.

30 MW PV solar bid located outside of the San Luis Valley

The only cost-competitive bid located outside the SLV was SP03 located north of Pueblo, involving a Section 123-compliant highly concentrating PV (HCPV) technology facility. Subsequent to receiving SP03's Best and Final offer, the developer informed Public Service that its targeted technology provider had entered bankruptcy and it appeared unlikely that any potential purchaser of the bankrupt company would honor the price quote provided to SP03 and also would not be able to provide SP03 a firm, updated quote on a timely basis. From mid-January through early May 2010, the Company worked with SP03

allowing the developer time to obtain firm pricing and annual generation estimates for their updated project. On May 5, SP03 provided the Company firm pricing for its proposed project; unfortunately, those values represented a 33% price increase above its Best and Final offer resulting in a bid that was substantially in excess of all remaining PV bids in the pool. The Company has informed SP03 that it is no longer under consideration.

PV solar bids located in the San Luis Valley

Three SLV projects totaling approximately 90 MW remain in the PV pool (SP06, SP19, SP20) with in-service years of 2014, 2012, and 2012 respectively. Each of these PV bids has different transmission interconnection plans which required the Company to conduct a special transmission study to estimate the relative cost of interconnecting each. The results of this study indicate that the two lowest cost bids are SP19 and SP20. Currently the Company has completed contract negotiations with one of these bidders and is in the process of negotiating a contract with the other while holding SP06 as a backup.

Solar Thermal with Thermal Energy Storage

In the 120-day report, bid SC04 was selected to fulfill the ~200 MW set-aside for solar thermal technologies with thermal energy storage ("TES"). As originally bid, SC04 proposed a 250 MW solar thermal facility with TES that consisted of two separate 125 MW phases; the first phase had an in-service date of July 1, 2013 and the second had an in-service date of January 1, 2014. Thus, the first phase of the project corresponded to the original expected in-service date for the SLV-Calumet-Comanche transmission project and provided for a 'ratable' addition of generating capacity. As discussed earlier in this report, with an upgrade to the San Luis Poncha 115 kV line the SLV transmission system can accommodate approximately 185 MW of additional generation. Thus, even if no additional PV generation were acquired through the 2009 All-Source RFP (i.e., in addition to the 25 MW from SunE and Sandhills), the Company could not accept the full 250 MW on an N-1 basis without additional transmission export capability being constructed or place customers at risk for curtailment costs due to insufficient firm transmission.

The SC04 bid price offered to the Company (and included in the 120-day report analyses), is dependent on the developer obtaining a U.S. Department of Energy Federal Loan Guarantee and beginning construction on the facility prior to September 30, 2011 as stipulated by the loan guarantee program. Given the large volume of Federal Loan Guarantee applications for solar projects and the time required to process this large number, the DOE has recently streamlined the process by which it reviews applications in order to more quickly arrive at executed loan agreements for projects that are likely to actually begin construction prior to the September 30, 2011 deadline. On a nationwide basis, one of the largest hurdles preventing the federal government from executing loan guarantees for large-scale solar projects has been the lack of clarity/certainty regarding transmission interconnection and delivery plans for the facilities seeking these loan guarantees.

In early March the developer for SC04 verified their need to file their initial DOE loan application for the project on April 22, 2010 in advance of completing a purchased power agreement. This approaching deadline coupled with the need for certainty regarding transmission availability in the DOE application process, prompted the developer of SC04 to approach the Company on March 15, 2010 and propose reducing the project down to a single

125 MW phase instead of the full 250 MW, two-phase project originally proposed. The developer felt this was the prudent course to ensure that they could apply for a federal loan guarantee and quickly make it through the application approval process and, ultimately, the due diligence reviews required in the federal loan guarantee program. The Company and the developer did discuss the concept of negotiating a purchased power agreement for the two-phase, 250 MW facility in which the parties would have the right to terminate the construction of the second phase in the event that, at some future date certain, the Company could not commit to a firm in-service date for the SLV-Calumet-Comanche transmission project. However, the developer was of the opinion that such an option in the purchased power agreement was likely to significantly reduce the chances of obtaining the DOE loan guarantee since the DOE would not know in advance if it was taking loan default risks on a 125 MW project or a 250 MW project. Therefore such an option is no longer being considered. On April 22, 2010, the developer of SC04 filed their initial DOE loan application with the DOE for a 125 MW solar thermal with storage project. The developer of SC04 is no longer pursuing the construction of a 250 MW-scale facility as a result of its 2009 All-Source RFP bid.

In the Phase I portion of Docket No. 07A-447E, the PUC approved a minimum 200 MW set aside for solar power with storage. Decision No. C08-0929, ¶ 63. In the Phase II portion of Docket No. 07A-447E, the Commission stated that it "granted the 200 MW set-aside on the assumption that reasonable bids will be received." Decision No. C09-1257, ¶ 48. The Commission then determined that reasonable bids had been received and approved negotiation with bid SC04 to fulfill the set-aside. As explained above, the limitation on firm transmission and the contract requirement to pay curtailment payments to solar developers if something other than firm transmission is used, has changed the assumptions that underlie that decision. As a result, it is no longer in the public interest for the Company to acquire the entire 200 MW solar generation set-aside at this time because this generation capacity is in excess of the Company's firm transmission capacity rights. To be clear, the Company did not receive any bids in the 2009-AllSource RFP for solar thermal with storage outside of the San Luis Valley and therefore all options to fulfill the entire 200 MW set-aside would result in solar generation capacity in the Valley in excess of the Company's firm transmission rights. Therefore, the Company requests that the Commission determine that, given the changed circumstances around the expected in-service date of the SLV-Calumet-Comanche transmission line, the Company is not obligated to fulfill the minimum 200 MW set-aside for solar thermal with storage in this 2007 CRP acquisition process.

Part V: Reasonableness of Solar Thermal with Storage Costs

Bid SC04 is designated as a Section 123 resource. CRS §40-2-123 (1) (a) requires the Commission to "give the fullest possible consideration" of "cost-effective implementation of new clean energy ... technologies" and allows the cost of such technologies to be balanced with the "beneficial contribution such technologies make to Colorado's energy security, economic prosperity, environmental protection, and insulation from fuel price increases." In including Bid SC04 in the approved portfolio, the Commission based its decision in part on information provided by the Company and the IE: "Public Service and the IE generally asserted that the concentrating solar with storage resources were only slightly more expensive than CC gas bids on a levelized cost basis" Decision No. C09-1257 ¶ 49. The Commission further considered the other benefits of a Section 123 resource in making its finding that including this Section 123

resource in the portfolio was in the public interest: "It is true that the levelized costs for resources involving this technology are slightly higher than CC gas bids, but it presents significant Section 123 benefits including reduction of carbon emissions and dispatchability of renewable resources." Decision No. C09-1257 ¶ 50.

As previously discussed, in response to the need for certainty regarding the availability of firm transmission, both the Company and the developer of the SC04 bid began exploring a 125 MW project that would consist of only the first Phase of the two Phase 250 MW project. In April 2010 the Company was provided with updated pricing for the downsized project. The developer of SC04 indicated it needed an approximate 10% price increase for the 125 MW project. The Company and the developer continued to negotiate and on May 10, the developer provided another updated bid price for the 125 MW project. This price update represented an increase in excess of 7% over the original bid price, but this price required a corresponding increase of the proposed term from 25 years to 30 years for the proposed 125 MW facility.

While the levelized cost for the SC04 solar thermal facility has increased since the 120-day report was issued (due to an increase in bid price), the levelized cost of alternatives such as combined-cycle gas technologies have declined during this same period as a result of lower natural gas price projections and a delay in the expected enactment of carbon legislation.[5] Figure 1 below details the cost comparison of SC04 and other thermal resources offered to the Company. The "As Bid" column represents the bid pricing and relative economics of the SC04 bid presented by the Company in the Phase II proceedings and 120-day report; the "As Updated" column represents current pricing and relative economics. As Bid, the energy cost of SC04 was approximately $10 to $25/MWh more expensive on a levelized cost basis in comparison to two of the lowest cost combined cycle bids offered in the 2009 All-Source Solicitation resulting in added costs between $8 and $20 million annually or $87 and $240 million on a PVRR basis. Based on this initial analysis the Company determined the added cost of $10/MWh for SC04 (i.e., the lower end of the range) could be determined to be reasonable in light of the goal to further the development of new solar technologies.

As Updated, the lower end of the additional levelized energy cost of bid SC04 has increased 170% to roughly $27/MWh over that of the combined-cycle gas alternatives. While the amount of energy the Company would purchase from the 125 MW facility would be less than 50% of the energy purchased from the original 250-MW scale facility (due to fewer hours of thermal storage being offered with the 125 MW facility), the additional annual cost associated with the 125 MW facility (with updated pricing) has increased by roughly 25% over the lower end of the range (i.e. from $8 million added cost annually to $10 million). Correspondingly, the lower end range of additional PVRR of the 125 MW facility has increased 36% compared to the gas alternatives.

[5] A delay relative to the January 1, 2010 date assumed for carbon regulation in the 2007 CRP.

Figure 1

Solar Thermal with Thermal Energy Storage Proposal		
Facility Characteristics	**As Bid [1]**	**As Updated [2]**
Size (MW)	250	125
Storage (hours)	6	4
Term (years)	25	30
Annual Generation (MWh)	812,521	382,882
Annual Capacity Factor	37%	35%
Levelized Energy Cost ($/MWh)		
PPA Only		redacted
% Increase		
PPA + Pro Rata Transmission Upgrades		
% Increase		
Additional Cost over Gas-Fired Alternatives [3]		
LEC ($/MWh)	$10 - 25	$27 - 48
Levelized Annual Cost ($ million)	$8 - 20	$10 - 18
PVRR ($ million)	$87 - 240	$118 - 218
Levelized Gas Cost ($/MMBtu) [4]		
10 year	$7.11	$6.12
20 year	$8.17	$7.25

Notes

1 - Carbon cost assumptions: $20/ton in 2010 escalating at 7% annually; Gas cost includes $1.28/MMBtu price volatility mitigation adder

2 - Carbon cost assumptions: $20/ton in 2014 escalating at 7% annually; Gas cost includes $1.00/MMBtu price volatility mitigation adder

3 - Lower end of range results from comparison to a 2009 All-Source RFP bid for a greenfield, 2x1 combined-cycle; upper end of range results from comparison to a brownfield conversion of CTs to combined cycle

4 - 10 - 20 year gas curves from recent forecast with no price volatility mitigation adder.

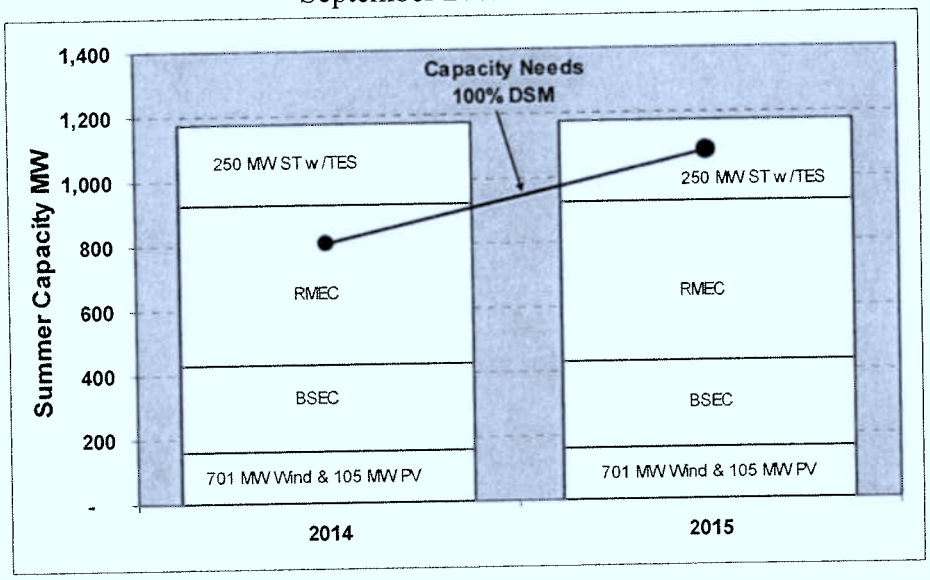
Of the approximate $17/MWh increase in the additional levelized energy cost of the Updated Bid over the As Bid project (that is, $27/MWh vs. $10/MWh), roughly [redacted]% can be attributed to a decrease in the gas price forecast, [redacted]% to assumptions in the delay to carbon emission costs, and the balance ([redacted]%) can be attributed to the bid energy price increase from SC04.

Given these changed circumstances, Public Service can no longer assert that bid SC04 is in a reasonable cost range in comparison to other combined-cycle gas bids. However, Public Service cannot determine if the public policy benefits as outlined in CRS §40-2-123 (e.g., energy security, economic prosperity, environmental protection, and insulation from fuel price increases) outweigh the increase in relative costs between a combined cycle power plant and this Section 123 resource. The Company provides this updated information and asks that the Commission consider if this changes its finding that inclusion of this Section 123 project is in the public interest.

Part VI: Reliability Impact and Future Resource Need

In October 2009 the Company filed its Annual Resource Plan Update with the Commission, including a Loads and Resource balance (L&R) for the PSCo system that reflected the resources of Portfolio 5 and the most recent forecast of customer demand (referred to as the September 2009 forecast[6]). This updated L&R showed 99 MW of excess capacity by year 2015. Figure 2 contains a summary of the L&R filed with the October 2009 Annual Resource Plan Update.

Figure 2 – L&R with 105 MW Solar PV and 250 MW Solar Thermal w/TES
September 2009 Forecast



With this CRP amendment, the Company is proposing to pursue up to 185 MW of solar generation which equates to approximately 167 MW of firm solar capacity in a L&R balance (125 MW + 70% of 60 MW = 167 MW). This reduced level of solar resources is 157 MW less than the 324 MW of firm solar capacity contained in Portfolio 5 (250 MW + 70% of 105 MW = 324 MW). Since the COD of the first phase of SC04 is tentatively scheduled for January 2014, Public Service did not include the capacity of the solar project in its L&R until the summer of 2014. Therefore any change to the SC04 bid will not impact the resource needs or selection until 2014 and beyond. When the Figure 2 L&R is updated to reflect this reduced level of solar acquisition (see Figure 3), there is a 57 MW shortfall in 2015.

[6] The September forecast of customer demand was lower than the March 2009 forecast. The March 2009 forecast was used in the Phase II bid evaluation process and subsequent 120-day report.

Figure 3 - L&R with 60 MW Solar PV and 125 MW Solar Thermal TES
September 2009 Forecast

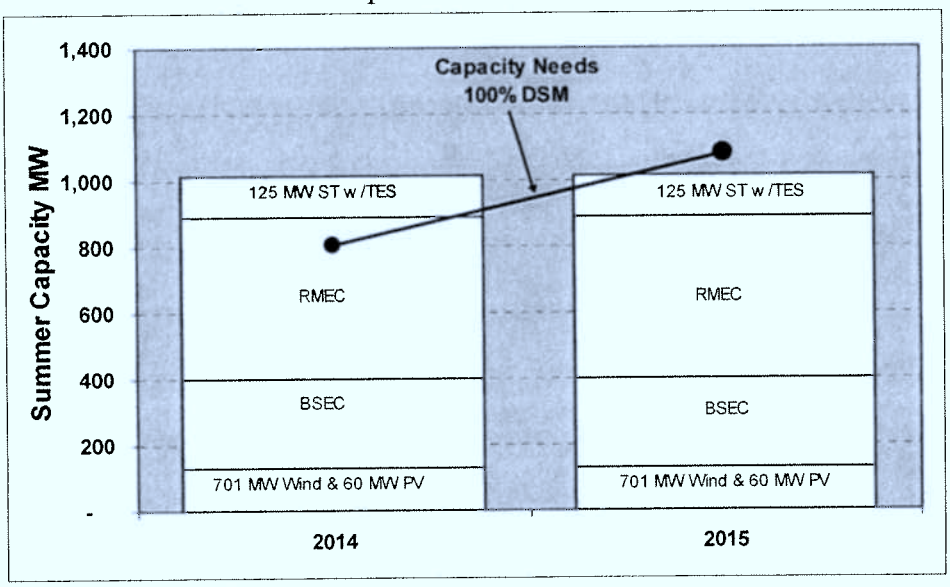
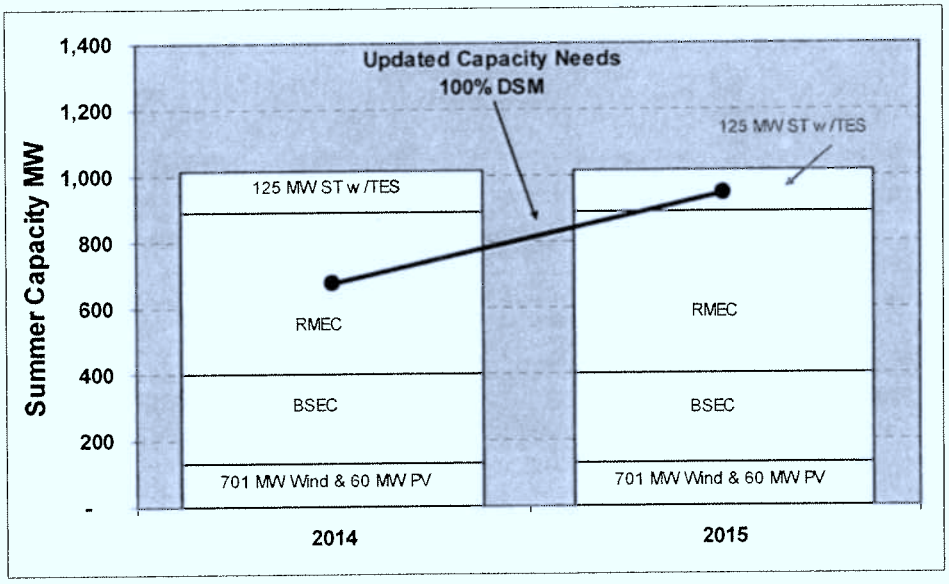


Figure 4 is a representation of the Company's most recent demand forecast completed in March 2010 coupled with a 185 MW level of solar resource acquisition. The new forecast has lower demand for 2014 and 2015 in comparison to the October 2009 forecast. Based on this March forecast and the 185 MW level of solar acquisition, the Company will have 75 MW of excess capacity by 2015.

Figure 4 - L&R with 60 MW Solar PV and 125 MW Solar Thermal TES
March 2010 Forecast



Potential impact of Public Interest finding

As set forth in Part V, the economics around bid SC04 have changed and the Company is requesting that the Commission consider if those changes impact its determination that the Company pursue this Section 123 resource at this time. If the Commission determines that acquisition of the Section 123 resource is still in the public interest, the Company will endeavor to complete the PPA negotiations and move the project toward successful completion along with solar PV bids SP19 and SP20.

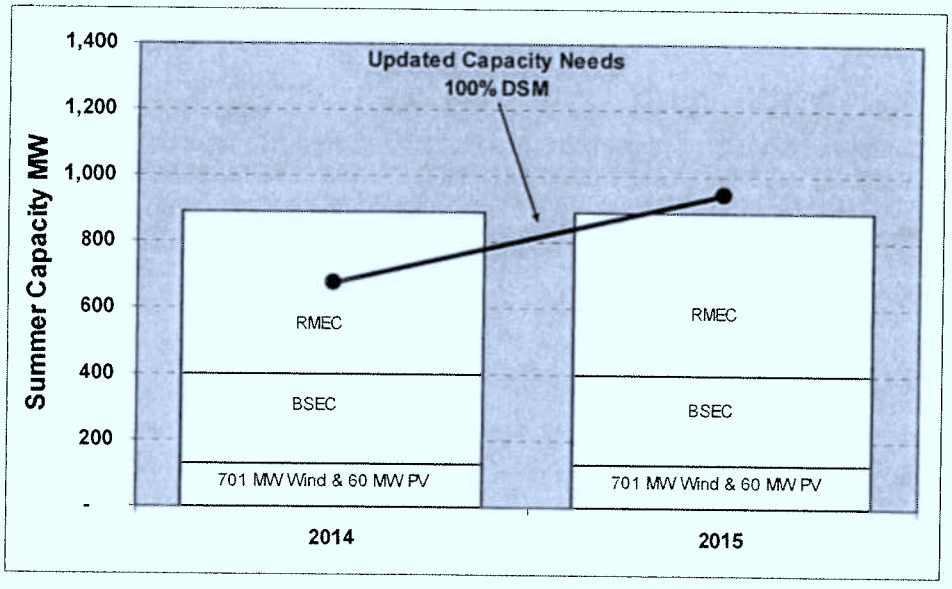
However, if the Commission determines that the Section 123 resource is not in the public interest at this time, the Company offers two alternative paths for Commission consideration:

1) Add bid SP06 to the preferred portfolio and pursue a total of 90 MW of PV solar in the San Luis Valley. Note that this alternative would require upgrades to the local 69 kV transmission system in the Valley; or

2) Delay the acquisition of additional solar resources above the 60 MW of solar PV represented by SP19 and SP20 until the Phase II acquisition process that will result from the 2011 Resource Plan filing.

If the PUC determines that the 125 MW should not be pursued at this time, the Company recommends against invoking a contingency plan to replace that generation capacity in 2014 and 2015. Figure 5 represents the Company's March 2010 forecast with only the 60 MW of solar PV included in the generation portfolio. The removal of both phases of the SC04 bid results in the Company being short[7] by only 50 MW of generation capacity by 2015. No additional resources are needed for 2014.

Figure 5 - L&R with 60 MW Solar PV and 0 MW Solar Thermal TES
March 2010 Forecast



[7] The term short is used in reference to achieving a 16.3% reserve margin above our firm load obligation. At this 50 MW short position, the Company would still have approximately 1,000 MW of planning reserve margin in 2015.

As a result, if the Commission decides to delay the acquisition of the large solar thermal resource at this time, the 50 MW level of generation capacity shortfall in 2015 does not pose a reliability concern. This level of shortfall can be met by a number of options including additional summer capability from Comanche 3,[8] deploying additional cost-effective DSM measures, making a short-term market purchase of additional generation capacity, all of which are allowed outside of a competitive acquisition process per Commission rules[9], or by waiting until the 2011 Resource Plan to acquire any additional generation capacity that might be needed. [10]

[8] Figures 2, 3, 4, and 5 assume Comanche 3 will have a summer net dependable capacity rating of 750 MW. Early indications are that the Comanche 3 facility may be capable of providing 50-80 MW more output during summer peak day conditions than the 750 MW that has been assumed to date in our planning processes. PSCo would get approximately 66% of this extra capacity.

[9] On page 11-12 of the August 2009 120-day report in Docket No. 07A-447E, the Company discussed how the resources of its preferred portfolio met all but 25 MW of the capacity needs and noted that "Public Service could meet the 25 MW projected shortfall in 2015 by deploying additional cost-effective DSM measures or by making a short-term market purchase of additional generation capacity outside of a competitive acquisition process as allowed by the Commission rules." Within the 120-day report, the Company took the position that a 25 MW shortfall was a very reasonable level of deviation from expected peak load given the inherent level of imprecision in forecasts and that by not filling the short position with bids, we made room for superior DSM results without posing any risk to the reliability of supply if the higher DSM levels are not attained.

[10] In Figures 2 through 5, wind is counted at 12.5%, PV solar at 70% of nameplate and solar thermal with TES at 100%.