



IN THE MATTER OF THE  
APPLICATION OF PUBLIC SERVICE  
COMPANY OF COLORADO FOR A  
CERTIFICATE OF PUBLIC  
CONVENIENCE AND NECESSITY  
FOR THE SAN LUIS VALLEY –  
CALUMET – COMANCHE  
TRANSMISSION PROJECT

DIRECT TESTIMONY AND  
EXHIBIT OF

JOSEPH C. TAYLOR

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO**

**IN THE MATTER OF THE APPLICATION OF     )  
PUBLIC SERVICE COMPANY OF                 )  
COLORADO FOR A CERTIFICATE OF             )  
PUBLIC CONVENIENCE AND NECESSITY        )  
FOR THE SAN LUIS TO CALUMET TO            )  
COMANCHE TRANSMISSION PROJECT         )**     **DOCKET NO. 09A-\_\_\_\_ E**

**DIRECT TESTIMONY OF JOSEPH TAYLOR**

1     **Q.     PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2     A.     My name is Joseph Taylor. My business address is 550 15th Street, Denver,  
3            Colorado 80202.

4     **Q.     BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

5     A.     I am employed by Xcel Energy Services Inc., the service company subsidiary  
6            of Xcel Energy Inc., the registered holding company parent of Public Service  
7            Company of Colorado (“Public Service” or “Company”). My title is Manager,  
8            Transmission Access.

9     **Q.     ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS DOCKET?**

10    A.     I am testifying on behalf of Public Service.

11    **Q.     HAVE YOU PREPARED A STATEMENT OF YOUR EXPERIENCE AND  
12            QUALIFICATIONS?**

13    A.     Yes. That statement is included as Attachment A to my testimony.

14    **Q.     WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

15    A.     The purpose of my testimony is to explain how the San Luis - Calumet -  
16            Comanche Transmission Project (“Project”) will help meet the renewable

1 resource requirements that have been approved in the Company's 2007  
2 Resource Plan. I will also discuss the process used by the Company and  
3 stakeholders, which ultimately determined that construction of the Project is  
4 an important step in meeting the goals of Senate Bill 07-100 ("SB07-100"), as  
5 stated in the Company's most recent informational filing.<sup>1</sup> To give context to  
6 those aspects of my testimony, I will also describe the five energy resource  
7 zones ("ERZs" or "Zones") that the Company has established.

8 **Q. PLEASE BEGIN BY DESCRIBING THOSE FIVE ZONES.**

9 A. Consistent with the requirements of SB07-100, Public Service has now  
10 designated five large ERZs in the State of Colorado. Three of the Zones are  
11 in eastern Colorado and two in southern Colorado. Exhibit No. JCT-1  
12 illustrates the five zones overlaid upon the wind and solar generation  
13 development areas ("GDAs") that were identified in the Senate Bill 07-091  
14 Task Force Report.

15 A short description of each Energy Resource Zone is provided below:

16 **Zone 1:** Zone 1 is in Northeast Colorado and includes all or  
17 parts of Sedgwick, Phillips, Yuma, Washington, Logan, Morgan,  
18 Weld, and Larimer Counties. The geography of this Zone is the  
19 same as described in the 2007 Report.

20 **Zone 2:** Zone 2 is in East Central Colorado, and includes all or  
21 parts of Yuma, Washington, Adams, Arapahoe, Elbert, El Paso,  
22 Lincoln, Kit Carson, and Cheyenne Counties. The geography of  
23 this Zone is also the same as described in the 2007 Report.

24 **Zone 3:** Zone 3 is in Southeast Colorado, and includes all of  
25 parts of Baca, Prowers, Kiowa, Crowley, Otero, Bent, Las  
26 Animas, and Pueblo Counties. This Zone is somewhat smaller  
27 than the Zone 3 that was described in the 2007 Report, as a  
28 portion of it has been incorporated into Zone 5.

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<sup>1</sup> See CPUC Docket No. 08M-821E.

1           **Zone 4:** Zone 4 is in the San Luis Valley, and includes all or  
2 parts of Costilla, Conejos, Rio Grande, Alamosa, and Saguache  
3 Counties. This Zone is slightly smaller than the Zone 4 that was  
4 described in the 2007 Report, as a portion of it has been  
5 incorporated into Zone 5.

6           **Zone 5:** Zone 5 is in South-Central Colorado, and includes all  
7 or parts of Huerfano, Pueblo, Otero, Crowley, and Las Animas  
8 Counties. This Zone is newly identified, and is more fully  
9 described below.

10   **Q.   WERE THERE ALWAYS FIVE ENERGY RESOURCE ZONES?**

11   A.   No. As indicated above, we expanded the number of Zones from four to five.  
12       Following the submission of the Company's SB07-100 filing in October 2007,  
13       we began holding stakeholder sessions in early 2008. During those  
14       stakeholder sessions, Public Service received feedback that a portion of  
15       south-central Colorado was not adequately represented by the original four  
16       Zone model, and that portions of the existing Zones 3 and 4 should be  
17       redrawn to better reflect the electric topography in that part of the state. In  
18       response to that input, Public Service presented the new five ERZ package to  
19       stakeholders on numerous occasions during the spring and summer of 2008,  
20       and received positive feedback. Public Service has described these ERZs in  
21       its most recent SB07-100 report, which it filed with the Commission on  
22       November 24, 2008 in Docket No. 08M-821E.

23   **Q.   HOW DOES THE SB07-100 PROCESS CHANGE THE WAY THE**  
24       **COMPANY PROPOSES TO BUILD TRANSMISSION FACILITIES FOR**  
25       **NEW GENERATION RESOURCES?**

26   A.   Historically, in the case of a Request For Proposal ("RFP") process, the  
27       Company would receive bids at various locations for generation resources,

1 and then determine if power from those generation projects could be  
2 delivered to load using the capability in the existing transmission system. If  
3 transmission upgrades were required, the results of  
4 transmission/interconnection studies would determine (i) what new facilities  
5 were required and (ii) when those facilities could be put in service. The  
6 problem with this approach, as has been fully vetted in a number of forums, is  
7 that generation facilities often take much less time to permit and construct  
8 than do transmission facilities.

9 In the SB07-100 process, the Company's goal is to plan and potentially  
10 build high voltage transmission facilities so that generators in favorable  
11 locations will be able to build and interconnect their projects more on the  
12 generator's timeframe. That is, instead of waiting for bids to determine where  
13 transmission is needed as was historically done, the Company is now trying  
14 to anticipate where generation will be located in advance of any actual bids.  
15 Under the SB07-100 process there may be more certainty around timeframes  
16 for the completion of transmission facilities required to deliver generation  
17 output to the Public Service load centers.

18 **Q. FROM YOUR PERSPECTIVE, WHY SHOULD PUBLIC SERVICE GIVE**  
19 **PRIORITY TO COMPLETION OF THIS PROJECT?**

20 A. Throughout the 2007 and 2008 stakeholder processes, we heard loud and  
21 clear that stakeholders wanted access to be able to offer more solar  
22 generation projects in the San Luis Valley. While the Company has existing  
23 injection capability in the Valley, additional transmission is required to import

1 significant levels of solar generation from the Valley to the front-range load  
2 centers. Developers have also expressed interest in the Wind Generation  
3 Development Area (“GDA”) 8<sup>2</sup>, and additional quality solar prospects exist  
4 throughout the new Energy Resource Zone 5. This Project meets SB07-100  
5 requirements, as it will alleviate transmission constraints to Energy Resource  
6 Zones, and it will allow substantial new levels of generation to meet Public  
7 Service’s resource needs.

8 **Q. HOW WILL THE PROJECT HELP MEET THE REQUIREMENTS FOR THE**  
9 **PUBLIC SERVICE 2007 COLORADO RESOURCE PLAN?**

10 A. As a result of Public Service’s approved Resource Plan, the Company has  
11 issued, and received proposals from, four RFPs. Public Service anticipates  
12 acquiring up to 700 MW of intermittent renewables and between 200 MW and  
13 600 MW of resources using concentrating solar with storage or gas backup.  
14 This Project will provide Public Service with the opportunity to fill much of its  
15 resource need from generation projects being developed along the Project  
16 route.

17 **Q. HOW DOES THE PROJECT MEET SB07-100 REQUIREMENTS?**

18 A. The Project provides the means to accommodate potential resource  
19 development in Zones 4 and 5. The San Luis Valley region, which lies within  
20 Zone 4, has been identified to have great promise for solar energy  
21 development, both in the form of photovoltaics (“PV”) and concentrated solar  
22 power. However, the existing transmission system in this region can only

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<sup>2</sup> Generation Development Area 8 is defined in the report of the Colorado Senate Bill 07-091 Renewable Resource Generation Development Area Task Force.

1 accommodate about 125 MW of new generation for delivery to Front Range  
2 load centers.<sup>3</sup> Furthermore, the line routing will provide interconnection  
3 opportunities for wind projects in Wind GDA 8, and the Calumet Substation  
4 will enable interconnections from potential wind and other beneficial resource  
5 additions in Zone 5 along the I-25 corridor south of Pueblo.

6 **Q. ARE GENERATION DEVELOPERS INTERESTED IN THIS REGION OF**  
7 **THE STATE?**

8 A. Absolutely. One measure of developer interest can be gauged by looking at  
9 the number of generator interconnection requests in a particular region. In  
10 the last thirteen months alone (i.e., March 1, 2008 - April 6, 2009), 1,698 MW  
11 of wind and 1,809 MW of solar generation interconnection requests have  
12 been made under the Large Generator Interconnection Process to Public  
13 Service for interconnections in Zones 4 and 5.

14 **Q. ARE THERE OTHER BENEFITS TO THE WIND AND SOLAR**  
15 **RESOURCES ALONG THIS PROJECT'S ROUTE?**

16 A. Yes. The San Luis Valley and a large region within Zone 5 contain the  
17 premier solar resource available to the Company. Solar generators located  
18 there should be able to provide the lowest cost solar energy available. Given  
19 that the Company has limited funds for renewable resources under the  
20 Renewable Energy Standard Adjustment ("RESA"), adding resources where  
21 they are most cost effective is in the best interest of the Company and its  
22 customers. In addition, it is expected that the wind resource along the Project

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<sup>3</sup> See Page 4 of Public Service Company Transmission System Information, filed March 13, 2009 in Docket No. 07A-447E.

1 route should show significant levels of geographic diversity from the wind  
2 resource areas where the Company currently purchases wind energy. Higher  
3 levels of geographic diversity should help keep wind integration costs lower  
4 and also allow the Company to maximize the total amount of wind generation  
5 under the 2% RESA cap.

6 **Q. HOW CAN THIS PROJECT HELP PUBLIC SERVICE MEET STATE**  
7 **RENEWABLE ENERGY STANDARDS (“RES”) REQUIREMENTS?**

8 A. Under Colorado law established as a result of House Bill 07-1281 and the  
9 current RES Rules, Public Service is required to generate or cause to be  
10 generated from eligible energy resources the following amounts of renewable  
11 energy:

- 12 • 2008 through 2010 - 5 percent of Public Service’s retail electric energy  
13 sales;
- 14 • 2011 through 2014 - 10 percent of Public Service’s retail electric  
15 energy sales;
- 16 • 2015 through 2019 - 15 percent of Public Service’s retail electric  
17 energy sales.
- 18 • 2020 forward - 20 percent of Public Service’s retail electric energy  
19 sales.

20 Additionally, at least four percent of the RES must be derived from solar  
21 electric generation technologies, and at least one-half of that amount must be  
22 generated from on-site solar systems (i.e., solar systems located at  
23 customer’s facilities) as defined in the RES Rules. In other words, Public

1 Service can meet up to 0.4% (20% X 4% X 1/2) of its retail energy sales with  
2 central (“utility scale”) solar projects. If those projects are located within the  
3 State of Colorado, they are also eligible for a 125% multiplier on the  
4 Renewable Energy Credits (“RECs”), which are the tool used to measure  
5 compliance with the RES.

6 **Q. COULD YOU GIVE AN IDEA OF WHAT PUBLIC SERVICE’S RES**  
7 **REQUIREMENTS FOR CENTRAL SOLAR WILL BE IN THE YEARS 2020**  
8 **AND 2046?**

9 A. Using the Company’s most recent load forecast,<sup>4</sup> the following table shows  
10 the Company’s estimates of the amount of central solar required to meet half  
11 of its solar RES for these two future years.

Year	(1) PSCo Retail Sales (MWh)	(2) RES Solar Requirement (MWh)	(3) Solar Capacity at 25% Capacity Factor (MW)	(4) In-State REC Multiplier	(5) In-State RES Requirement (MW)
2020	32,887,179	131,549	60	1.25	48
2046	43,451,155	173,805	79	1.25	63

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13 **Q. WILL YOU DESCRIBE THE FIGURES PRESENTED IN THIS TABLE?**

14 A. Certainly. Column (1) is the Company’s projection of its retail energy sales.

15 Column (2) is Column (1) multiplied by 0.4% (20% X 4% X ½). Column (3) is

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<sup>4</sup> On March 19, 2009, Public Service filed an updated load forecast that indicated reduced peak load and energy sales for the resource acquisition period in the Colorado Resource Plan docket, Docket No. 07A-447E. The numbers cited herein for the years 2020 and 2046 came from that same load forecast.

1 Column (2) divided by the product of 8,760 hours/year X 30%, where the 25%  
2 figure is a conservative estimate of the expected annual capacity factor of  
3 central solar generation. Column (4) is the entry for the 1.25 REC multiplier  
4 for projects located within the State of Colorado. Column 5 is Column (3)  
5 divided by Column (4).

6 **Q. WHAT ARE THE CONCLUSIONS YOU REACH FROM THIS TABLE?**

7 A. If you assume that all of Public Service's central solar requirements will be  
8 met by resources built inside Colorado, we can meet one-half of our solar  
9 RES by having 48 MW of central solar in 2020 and 63 MW by 2046. By  
10 contrast, the Company could potentially install up to 600 MW of central solar  
11 generation in the existing All-Source RFP, which means we could have  
12 almost 10 times of our 2046 central solar RES met as soon as 2015.

13 **Q. ARE THERE OTHER REASONS FOR THE COMPANY TO BE**  
14 **INTERESTED IN INSTALLING SO MUCH CENTRAL SOLAR WHEN IT IS**  
15 **NOT REQUIRED AS A RESULT OF THE RES REQUIREMENTS?**

16 A. Yes. While I am not the Company's expert on environmental policy, I do know  
17 that the Company is taking significant steps and evaluating additional  
18 measures toward meeting the Governor's Climate Action Plan targets for  
19 carbon dioxide emission reductions. Installing significant amounts of wind  
20 and solar generation will play an important role in any effective carbon  
21 reduction strategy.

22 **Q. HOW MUCH WIND AND SOLAR DOES THE COMPANY HAVE ON ITS**  
23 **SYSTEM TODAY?**

1 A. Public Service has 1,084 MW of wind and 8 MW of central solar PV today.  
2 As a result of the 2008 Public Service Wind RFP, an additional 152 MW of  
3 wind will be on the system by the end of 2009, for a 2009 year end total of  
4 1,236 MW. As a result of the central solar RFP that was also completed late  
5 last year, we are adding an additional 16 MW of PV central solar for a 2010  
6 year end total of 24 MW. In addition, the Company expects to have about 45  
7 MW of on-site solar by the end of 2009.

8 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

9 A. Yes.

**Attachment A**  
**Statement of Qualifications**  
**Joseph C. (Joe) Taylor**

Mr. Taylor received a Bachelor of Science degree in Petroleum Engineering in December 1984 from Texas A&M University, and a Master of Business Administration in May 1992 from the University of Texas-El Paso.

Since 1985, Mr. Taylor has held a number of power marketing, contracts and transmission-related positions in the electric utility industry. During this time, he has been employed by El Paso Electric Company (1985-1995), Plains Electric Generation and Transmission Cooperative (1995-2000) and Tri-State Generation and Transmission Association (2000-2004).

In November 2004, Mr. Taylor joined Xcel Energy as Manager of Transmission Access, with responsibility for obtaining and maintaining the transmission services required for the native and wholesale loads of Public Service Company of Colorado and Southwestern Public Service Company, two of the operating companies of Xcel Energy.

Mr. Taylor has served on numerous committees in the Western Interconnection and the Southwest Power Pool, and has filed testimony before the Colorado Public Utilities Commission, New Mexico Public Regulation Commission, the Public Utility Commission of Texas and the Federal Energy Regulatory Commission.