



IN THE MATTER OF THE APPLICATION
OF PUBLIC SERVICE COMPANY OF
COLORADO FOR APPROVAL OF ITS 2009
RENEWABLE ENERGY STANDARD
COMPLIANCE PLAN

DOCKET NO. 08A-_____E

DIRECT TESTIMONY

OF

ARTHUR R. WARREN

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

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PUBLIC SERVICE COMPANY OF)	DOCKET NO. 08A-____E
COLORADO FOR APPROVAL OF ITS 2009)	
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**DIRECT TESTIMONY OF
ARTHUR R. WARREN**

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

2 A. My name is Arthur R. Warren. My business address is 550 15th Street,
3 Suite 1000, Denver, CO 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
6 subsidiary of Xcel Energy Inc., the registered public utility holding
7 company parent of Public Service Company of Colorado ("Public Service",
8 or "Company"). My title is Senior Analyst, Resource Planning and
9 Acquisition. My qualifications are included as Attachment A to this direct
10 testimony.

11 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

12 A. I am sponsoring the Modeling of the RES and No RES Plans in the 2009
13 Renewable Energy Standard Compliance Plan in Volume 1, Section 6,
14 including supporting Tables 6-1 and 6-2.

15 **Q. WHAT IS THE RES PLAN?**

1 A. The RES Plan is the Company's Plan developed from the results of the
2 Company's Phase I Resource Plan. The RES Plan includes both existing
3 Eligible Energy Resources, estimates of the new Eligible Energy Resources
4 that will be acquired through Phase II of the CRP process, as well as
5 estimates of what will be acquired for the ten year RES Planning Period
6 required by Rule 3661(h) in order to meet or exceed the Company's
7 Renewable Energy Standard obligations.

8 **Q. WHAT IS THE NO RES PLAN?**

9 A. The No RES Plan is the same as the Company's RES Plan, except that all the
10 non Section 123 Eligible Energy Resources that the Company has acquired
11 since the passage of Amendment 37 (with the exception of the four Eligible
12 Energy Resources that were selected from the Company's 2005 All Source
13 RFP)¹ have been replaced by alternative non-eligible resources reasonably
14 available. Section 123 resources appear in both the RES and No Res plans.

15 **Q. WHAT SECTION 123 RESOURCES APPEAR IN BOTH THE RES AND NO**
16 **RES PLANS?**

17 A. The only Section 123 Eligible Energy Renewable resource that we have
18 assumed in this time period to be a Section 123 Resource for both plans is a
19 200 MW Solar Thermal facility with Storage in year 2013. We have made this
20 assumption due to the set-aside for this resource approved by the
21 Commission in Docket No. 07A-447E. If the All Source RFP that the
22 Company issues in January 2009 results in proposals for additional Section

¹ The Commission granted the Company's request for a waiver to consider these four resources as "sunk" resources in both the RES and No RES Plans by Decision No. C07-0676.

1 123 Resources, then subsequent RES compliance filings will show those
2 resources in both the RES Plan and the No RES Plan.

3 **Q. WHY DO SECTION 123 RESOURCES APPEAR IN BOTH THE RES AND**
4 **NO RES PLANS?**

5 A. Pursuant to Commission orders, Section 123 Resources do not impact the
6 retail rate impact limitation. By modeling these Section 123 resources in both
7 the RES and No RES Plan, the costs and benefits of these resources do not
8 materially impact the differential between the two plans – and therefore do not
9 materially affect the calculation of the incremental cost of the RES Plan over
10 the No RES Plan.

11 **Q. WHY DOES THE COMPANY PREPARE A RES PLAN AND A NO RES**
12 **PLAN?**

13 A. Commission Rule 3661(h) requires this analysis so that a sophisticated
14 estimate of the incremental costs of the new Eligible Energy Resources can
15 be made. By law, the utility may not increase retail customer bills by more
16 than two percent in a year to recover these incremental costs. Both plans are
17 developed using a computer modeling program (i.e., Strategist) that
18 determines the least-cost mix of electric power supply resources to add to the
19 existing system. The RES Plan shows the costs of the Company's Plan; the
20 No RES Plan excludes from the RES Plan the new non Section 123 Eligible
21 Energy Resources and replaces them with a least-cost mix of non-renewable
22 resources.

1 **Q. WHAT METHODOLOGIES AND ASSUMPTIONS WERE USED FOR THE**
2 **RES/NO RES MODELING?**

3 A. Public Service used modeling methodologies and assumptions consistent with
4 those used in the Company's 2007 Colorado Resource Plan (CRP), with
5 appropriate updates and modifications ordered by the Commission in its CRP
6 Phase I decisions in Docket No. 07A-447E.

7 **Q. PLEASE EXPLAIN THE RESULTS OF THE RES AND NO RES MODELING**
8 **THAT ARE SHOWN ON TABLES 6-1 AND 6-2.**

9 A. Table 6-1 contains output from the STRATEGIST model of the estimated
10 overall generation-related costs of serving the electric energy requirements of
11 the Public Service system (fuel, VOM, FOM, capital, purchase power, etc). ²
12 Table 6-1 shows the overall costs of the No RES and RES Plans in each year
13 of the RES Planning Period. The differences between these plans in each
14 year are the Incremental Costs of the new Eligible Energy Resources in the
15 RES Plan over the new nonrenewable resources in the No RES Plan. The
16 Total Renewable Energy Costs column shows the projected costs of the new
17 Eligible Energy Resources assumed in the RES Plan. The Derived ECA Costs
18 column sets forth the annual differences between the Total Renewable
19 Energy Costs and the Incremental Costs. Therefore this column estimates
20 the portion of the costs of the new Eligible Energy Resources that matches
21 the estimated costs of the avoided new non-renewable resources. These
22 "matching costs" do not factor into the calculation of the retail rate impact

1 limitation. Public Service proposes to continue to recover these matching
2 non-incremental costs through the ECA, which is why the column is
3 designated as the Estimated ECA Costs. The last column of Table 6-1
4 contains estimates of the ongoing net costs (over benefits) of SunE Alamosa
5 and all On-Site solar installed as of the end of 2008. These estimates of
6 ongoing net cost were developed using the same assumptions that were used
7 in modeling the RES and No RES plans reported in the 2008 Compliance
8 Plan. Ongoing net costs represent the net cost (or benefit) of renewable
9 resources that are operational at the time of each RES Compliance filing and
10 therefore are included in both the RES and No RES plans. Therefore to
11 ensure that the ongoing net costs/benefits and associated retail rate impacts
12 of renewable resources that are operational at the time of each Compliance
13 filing are not forgotten, it is necessary to separately account for them over the
14 life of the associated renewable resource. Table 6-1 is the Company's Base
15 Case.

16 Table 6-2 presents the same information, with the exception that the
17 resources that currently support the Windsource program (including the costs
18 of those resources) have been removed from the No RES Plan. Since these
19 WindSource resources and associated costs are included in the RES Plan,
20 the incremental cost, (which is the difference between the RES Plan and the
21 No RES Plan) reflects the added costs of the current Windsource generation.

² These costs do not include all costs the Company incurs to provide electric service such as transmission O&M, distribution O&M, return on existing rate base, etc.

1 The estimated Windsource Revenues are set forth in the column labeled
2 "Windsource Revenues" of Table 6-2.

3 **Q. HAVE YOU ALSO UPDATED THE CALCULATION OF THE WINDSOURCE**
4 **PREMIUM?**

5 A. Yes. As the Company proposed in Docket No. 08A-260E, if the Commission
6 approves our Windsource application, we plan to present in each Renewable
7 Energy Compliance Plan an updated estimate of the Compliance Plan Year's
8 Windsource premium. The updated calculated premium for 2009 is \$22.85³
9 per MWh.

10 **Q. WHAT ASSUMPTIONS OF THE COST OF CARBON (CO₂) WERE USED IN**
11 **MODELING THE RES AND NO RES?**

12 A. In modeling both the RES and No RES Plans the Company used twenty
13 dollars per ton for the cost of carbon beginning in 2010 and escalating at
14 seven percent over the planning period. This carbon assumption is consistent
15 with the Commission decision of Phase I of the 2007 Colorado Resource
16 Plan. Since this carbon cost was included in the RES and No RES Plans, the
17 reduction in carbon production resulting from the addition of Eligible Energy
18 Resources in the RES Plan reduces the incremental costs of the RES Plan.

19 **Q. WAS THE COST OF CARBON USED IN ANY OTHER CALCULATIONS?**

20 A. Yes, when forecasting the retail rate revenues and the associated RESA Rider
21 Revenues the Company included the cost of carbon, for those emissions that
22 are in excess of the level suggested by the 20% greenhouse gas emission

³ The \$22.85 is the result of the \$21.85/MWh calculated premium plus a \$1.00/MWh addition for administrative costs, consistent with the methodology that the Company proposed in Docket No. 08A-260E.

1 reduction proposed in the Governor's Colorado Climate Action Plan. While
2 there is much uncertainty regarding future carbon legislation and what will be
3 needed to meet Governor Ritter's "Colorado Climate Action Plan", the
4 Company felt it was appropriate to include the cost of carbon emissions
5 above the 20% reduction goal as our best estimate of the cost impact of
6 possible carbon legislation, for the limited purpose of calculating the RESA
7 Rider Revenues in the RES Compliance Plan. This would be an additional
8 operational cost for the Company and it was assumed that there would be a
9 retail allocation of the carbon costs above the 80 percent threshold. This
10 allocation of only that incremental carbon cost above the 80 percent level
11 increases the estimates of future retail revenues and the calculation of the
12 RESA Rider Revenues provided in Tables 6-3 and 6-4 beginning in 2010. As
13 a legislative resolution on carbon begins to take shape, the Company will have
14 more information available to refine our estimates related to carbon.

15 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

16 **A.** Yes.

Statement of Qualifications

Arthur R. Warren

I completed my undergraduate studies in 1983 at University of Colorado receiving a Bachelor of Science in Mechanical Engineering.

I have been employed by Public Service Company of Colorado, New Century Services, Inc., and now Xcel Energy Services Inc. since 1979. During my tenure I have held positions in system protection, regional system planning, gas system planning, risk services, and now in Resource Planning and Bidding for Xcel Energy Services Inc. In these positions I have conducted numerous analytical analyses related to fuel, demand, energy, and other regulated industry subjects.

My current activities in the Resource Planning and Bidding involve technical and numerical analyses as needed and required, but not limited to, the evaluations of generation resource needs and supplies associated with Xcel Energy's operating companies.