BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

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IN THE MATTER OF THE	**)**
APPLICATION OF PUBLIC SERVICE	**)**
COMPANY OF COLORADO FOR	**)**
APPROVAL OF ITS 2016 ELECTRIC	**) PROCEEDING NO. 16A-0396E**
RESOURCE PLAN	

DIRECT TESTIMONY AND ATTACHMENTS OF KENT L. SCHOLL

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

May 27, 2016

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

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IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR APPROVAL OF ITS 2016 ELECTRIC RESOURCE PLAN	**)))) PROCEEDING NO. 16A-0396E**

SUMMARY OF TESTIMONY OF KENT L. SCHOLL

Mr. Kent Scholl is a Senior Resource Planning Analyst for Xcel Energy Services, Inc. In this position he is responsible for the quantitative and non-quantitative analysis of proposed capacity and energy additions and proposed wholesale purchase and sales transactions across all of Xcel Energy's utilities, with primary responsibilities on the Public Service Company of Colorado system.

Mr. Scholl provides a general overview of the Company's proposed Phase II resource acquisition process that follows Phase I of this 2016 ERP proceeding. The Company proposes to use a competitive acquisition process through which new and existing supply-side generators can compete to meet the generation capacity need identified in Phase I of this ERP. All supply-side generation technologies except coal-fired generation will be allowed to compete in this process. In addition, the Company proposes a process through which supply-side generation resources greater than a 100 kW nameplate rating can be offered and evaluated.

Mr. Scholl sponsors the ERP Volume 3 documents the Company proposes to use to solicit power supply proposals in the Phase II process that will allow a variety of generation technologies to be offered, as well as a variety of ownership and contracting structures (PPA, Company self-build, Build-Own-Transfer).

Mr. Scholl also sponsors a solar integration cost study (Attachment KLS-1), and an effective load carrying capability ("ELCC") study of existing and incremental solar generation resources (Attachment KLS-2). The $/MWh costs calculated in the solar integration cost study were relatively low compared to the expected and/or historical cost of solar generation and are not expected to influence any decision as to the cost-effectiveness of potentially acquiring additional solar generation. The ELCC study found that current estimates of ELCC for existing levels of solar generation were mostly consistent with the results from the Company's prior solar ELCC study; studies of incremental solar generation determined the level of ELCC degradation that occurs. The Company used the results of the 2 GW and 3 GW Wind Integration Cost Study in its analyses of the costs and benefits of the alternate plan portfolios presented in Volume 1 of this ERP, and will provide an update to the study in a supplemental filing in June 2016.

Mr. Scholl also describes the Company's expanded study of 30-Minute Flex Reserves, which the Company expects to file in June 2016.

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

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DIRECT TESTIMONY AND ATTACHMENTS OF KENT L. SCHOLL

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Attachment No. KLS-1	An Integration Cost Study for Solar Generation Resources
Attachment No. KLS-2	An Effective Load Carrying Capability Study of Existing and Incremental Solar Generation Resources

BEFORE THE PUBLIC UTILITIES COMMISSION
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DIRECT TESTIMONY AND ATTACHMENTS OF KENT L. SCHOLL

I. INTRODUCTION, QUALIFICATIONS, AND PURPOSE OF TESTIMONY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. Kent L. Scholl, 1800 Larimer Street, Denver, Colorado 80202.

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

A. I am employed by Xcel Energy Services, Inc. My position is Senior Resource Planning Analyst.

Q ON WHOSE BEHALF ARE YOU TESTIFYING?

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

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

A. Yes, that statement is included at the end of my testimony.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. My testimony will address two main topics. First, I provide a general overview of the Company's proposed Phase II resource acquisition process. Second, I

describe and present the results of recently-completed integration cost and reliability studies related to solar generation, an integration cost study of wind resources, and an expansion of a 30-Minute Flex Reserves study.

II. PHASE II RESOURCE ACQUISITION PROCESS

Q. PLEASE SUMMARIZE THE COMPANY'S PLAN FOR ACQUIRING ADDITIONAL RESOURCES IN PHASE II OF THIS 2016 ERP.

A. As discussed in Section 1.6 of Volume 1, the Company proposes a competitive acquisition process through which new and existing supply-side generators can compete to meet the generation capacity need identified in Phase I of this ERP. The Company proposes to allow all supply-side generation technologies except coal-fired generation to compete. In addition, the Company proposes a process through which supply-side generation resources greater than a 100 kW nameplate rating can be offered and evaluated.

Q. WILL THE COMPANY ACCEPT BIDS FROM DEMAND-SIDE RESOURCES IN THE PHASE II COMPETITIVE ACQUISITION?

A. No, it will not.

Q. WHY NOT?

A. The Company's loads and resources table (which is used to determine the need for incremental resources within the resource acquisition period) incorporates the Colorado Public Utilities Commission's ("Commission") decision in the 2013 DSM Strategic Issues proceeding (Proceeding No. 13A-0686EG) setting out the future peak load reductions the Company is to assume in this ERP filing for demand-side resources. The exclusion of demand-side resource acquisition from the Company's ERP is consistent with

the Commission's decision in the Company's 2007 ERP (Proceeding No. 07A-0447E).

Q. WHY WILL THE COMPANY NOT ACCEPT BIDS FROM COAL-FIRED GENERATORS?

A. For two main reasons. The first is related to certain actions taken by the Environmental Protection Agency ("EPA"). Under the EPA's final New Source Performance Standards developed under Section 111(b) of the Clean Air Act ("CAA"), new coal power plants can emit no more than 1,400 lbs CO2/MWh, which almost certainly requires the use of carbon capture and storage ("CCS") technology. CCS technology for coal plants thus far has proven very expensive, and thus is unlikely to be cost competitive versus other technologies. In addition, the EPA has issued final rules for the Clean Power Plan ("CPP") developed under Section 111(d) of the CAA, which regulate carbon emissions from existing plants. As described in greater detail in the testimony of Company witnesses Ms. Alice Jackson and Mr. James Hill, implementation of the CPP has been stayed pending review by the U.S. Court of Appeals for the D.C. Circuit and the U.S. Supreme Court, and the State of Colorado has not determined the structure of its implementation plan. As a result, there is a fair amount of uncertainty at this time as to the ultimate impact of the Clean Power Plan on the Company and its customers. Without greater clarity on the potential compliance costs of incremental coal-fired generation and its concomitant carbon dioxide emissions, it is prudent at this

time for the Company to not seek proposals for incremental coal-fired generation.

Q. WHAT IS THE SECOND REASON?

A. The second reason is the impact that baseload generation such as coal has in the Company's portfolio on the integration costs of renewable generation such as wind and, to a lesser extent, solar.

Q. PLEASE EXPLAIN.

A. Wind generation has been a cost-effective generation resource in the Company's portfolio for some time. In the 2013 solicitation, solar was--for the first time--also a cost-effective generation resource. The Company expects wind and solar to continue to be cost-effective resources in the future. However, integration of these variable energy generators ("VERs") result in incremental system costs due to their: 1) non-dispatchability, 2) variability, and 3) forecast uncertainty. In general, integration costs are mitigated as the balance of the Company's generation portfolio becomes more flexible. Compared to other resources, coal plants are quite inflexible because they require substantial ramp-up time after they have been shut down. Coal plants need to run at a minimum level to avoid shutdown and remain an economic resource. To the extent the Company needs incremental generation to meet a capacity need, VER integration costs are minimized with generation more flexible than coal-fired resources, such as gas-fired plants.

Q. PLEASE PROVIDE AN OVERVIEW OF THE GENERAL PROCESS BY WHICH POWER SUPPLY PROPOSALS WILL BE EVALUATED IN PHASE II OF THIS PROCEEDING.

A. Generally, the process will involve three primary activities: 1) proposal processing and initial due diligence, 2) static economic screening, and 3) computer modeling. Other than the processes proposed to evaluate bids less than 10 MW, this general process is consistent with the overall process employed by the Company and monitored by the Independent Evaluator in the 2013 Request for Proposals ("RFP") solicitation. A more detailed description of the evaluation process is contained in Section 2.9 of Volume 2.

Q. IS THE PORTFOLIO MODELING PROCESS UTILIZED IN PRIOR PHASE II COMPETITIVE ACQUISITIONS COMPATIBLE WITH GENERATION RESOURCES DOWN TO 100 kW?

A. Not necessarily. As described in greater detail in Section 2.9 of Volume 2, the Strategist tool used by the Company to develop and evaluate generation portfolios can fail to determine the least-cost portfolio of bids if it is presented with too many generation alternatives. This is because the number of potential portfolios in Strategist grows exponentially with the number of potential projects. This issue is exacerbated by numerous small nameplate capacity bids, which could exceed the data storage capabilities of the Strategist model. In such situations, the Strategist model begins to truncate portfolios (i.e., not examine all relevant portfolios) with the potential outcome of not finding the most cost-effective portfolios.

Q. PLEASE DESCRIBE THE PROCESS THE COMPANY PROPOSES TO EVALUATE GENERATION RESOURCES DOWN TO A 100 kW SIZE IN THE 2016 ERP PHASE II COMPETITIVE ACQUISITION.

A. In general, the Company intends to pass generation resources no smaller than 10 MW through its Strategist portfolio modeling. This is consistent with how bids were evaluated in the 2013 RFP solicitation. The Company will review the generation resource types selected by the model in the least-cost portfolio. In its final portfolios, the Company will include bids greater than 100 kW and less than 10 MW that are similar generation resources as those included in the least-cost portfolio and that have all-in levelized energy costs less than the most expensive bid in the least-cost portfolio with the same generation resource. Specific detail regarding the Company's proposed resource evaluation process is provided in Section 2.9 of Volume 2.

Q. PLEASE PROVIDE AN EXAMPLE OF THE PROCESS.

A. Assume that the most expensive solar bid included in the least-cost portfolio has a $60/MWh all-in levelized energy cost ("LEC"), and further that eligible solar bids were proposed that are less than 10 MW with the following all-in levelized energy costs:

Bid #	LEC ($/MWh)	Size (MW)
1	$45	2
2	$52	1
3	$59	5
4	$62	5
5	$75	2

In this instance, the Company would include Bids 1-3 (totaling 8 MW) in the preferred portfolio along with those proposals selected by Strategist.

Q. WILL THE COMPANY BE SUBMITTING ANY OWNERSHIP PROPOSALS?

A. The Company does intend to provide ownership proposals in the Phase II process. These Company proposals will be compared against the proposals offered from other entities. Company proposals will be submitted with capital costs and operation and maintenance ("O&M") costs. To the extent incremental transmission interconnect and transmission delivery costs are needed for a Company proposal, those costs will be assessed in a similar manner as for proposals from Independent Power Producers ("IPPs") and other utilities. The capital and O&M costs for Company proposals will be evaluated at the values proposed.

Q. HAS THE COMPANY PROVIDED THE DOCUMENTS IT PROPOSES TO USE TO SOLICIT POWER SUPPLY PROPOSALS IN THE PHASE II COMPETITIVE ACQUISITION PROCESS?

A. Yes. These documents are included in Volume 3. These documents include RFPs that allow a variety of generation technologies to be offered, as well as a variety of ownership and contracting structures (PPA, Company self-build, Build-Own-Transfer). The RFPs include model purchased power contracts and basic terms and conditions for Build-Own-Transfer ("BOT") arrangements respectively as well as electronic bid forms that allow the Company to efficiently calculate all-in levelized energy costs for the various generation resource and ownership types.

III. INTEGRATION COST AND RELIABILITY STUDIES

Q. PLEASE PROVIDE AN OVERVIEW OF THE INTEGRATION COST AND RELIABILITY STUDIES YOU WILL DISCUSS IN YOUR TESTIMONY.

A. I will discuss the following study reports that have been filed with my testimony:

- Attachment KLS-1: a study report entitled "An Integration Cost Study for Solar Generation Resources on the Public Service Company of Colorado System"; this is an update to the Company's most recent solar integration cost study; and
- Attachment KLS-2: a study report entitled "An Effective Load Carrying Capability Study of Existing and Incremental Solar Generation Resources on the Public Service Company of Colorado System"; this is an update to the Company's most recent solar ELCC study report.

I will also briefly discuss an expanded 30-Minute Flex Reserve study that we intend to file when it is completed in June 2016.

A. Solar Integration Cost Study Report

Q. WHEN DID THE COMPANY LAST CONDUCT A SOLAR INTEGRATION COST STUDY?

A. In February 2009, the Company filed a solar integration cost study report with the Commission in Proceeding No. 07A-447E.

Q. WHY DID THE COMPANY DECIDE TO UPDATE THIS STUDY FOR THE 2016 ERP?

A. An update to the prior study is justified for two primary reasons. First, many of the assumptions made for the prior study are no longer valid. For instance, the lowest annual gas price assumed in that study was $7.83/MMBtu; the Company currently does not expect annual gas prices that high for over 15 years. Also, each portfolio scenario studied assumed a minimum level of 200 MW of solar thermal with thermal energy storage. Given the evolution in cost of photovoltaic ("PV") and solar thermal generation, the Company currently anticipates that additional levels of PV generation will likely be found cost-effective in the upcoming years, whereas solar thermal generation will not. Second, after the Company published its prior study, the National Renewable Energy Laboratory ("NREL") published its "Solar Power Data for Integration Studies" datasets. In these datasets NREL provided, for the first time, estimates of day-ahead solar generation forecasts and realized/actual solar generation pairs needed to conduct such studies. In the prior study, the Company had to create a proxy for day-ahead solar generation forecasts as none existed at the time.

Q. WHAT CHANGES TO THE STUDY METHODOLOGY WERE MADE IN THE CONDUCT OF THE CURRENT STUDY?

A. The base methodology utilized in the study was not changed. The Company did, however, use a different unit-commit and dispatch computer model of the Company's system (i.e., PLEXOS® vs. Cougar®) and did use the NREL forecast/realized solar generation pairs described above instead of the proxy derived for the prior study.

Q. IN GENERAL TERMS DESCRIBE THE OUTCOME OF THE STUDY.

A. The $/MWh costs calculated in the study were relatively low compared to the expected and/or historical cost of solar generation and are not expected to influence any decision as to the cost-effectiveness of potentially acquiring additional solar generation. The highest average integration cost ($0.74/MWh) was found for the high gas cost and high solar penetration scenario; the lowest cost found at the low gas cost and lower solar penetration scenario was $0.01/MWh. Solar generation acquired as part of the 2011 ERP averaged roughly $60/MWh; thus, even at the high end of forecast gas and solar penetration rates, the level of solar integration costs studied is roughly 1% of the acquisition cost of utility-scale solar.

Q. DID THE COMPANY UTILIZE THE RESULTS FROM THE PREVIOUS SOLAR INTEGRATION COST STUDY IN THE 2011 ERP?

A. Yes. Estimates of solar integration costs from the previous study were included in the Phase I plan alternatives and used in the Phase II competitive solicitation.

Q. DOES THE COMPANY BELIEVE THAT THE SOLAR INTEGRATION COST METHODOLOGY EMPLOYED IN THE 2009 AND 2016 SOLAR INTEGRATION COST STUDIES REMAINS RELEVANT?

A. The methodology remains relevant, but it does not capture a potentially larger driver of solar integration costs on the bulk electric system. As further described in the study report, primary solar integration costs are likely driven by the short-term variability of solar generation rather than the day-ahead

uncertainty methodology utilized in the previous and current solar integration cost studies.

Q. HOW DOES THE COMPANY PLAN TO UTILIZE THE RESULTS FROM THE UPDATED SOLAR INTEGRATION COST STUDY IN THE 2016 ERP?

A. Solar integration costs based on the higher level of solar installation from the study have been assumed in the Phase I plan alternatives filed in the 2016 ERP, and will be included in Phase II evaluations of solar generation proposals.

Q. ARE THE SOLAR INTEGRATION COSTS CALCULATED IN THE CURRENT STUDY THE ONLY INTEGRATION COSTS THAT MIGHT IMPACT THE COMPANY'S SYSTEM?

A. No. As indicated above and in the study report, primary sources of solar integration cost on the bulk electric system are more likely driven by shorter-term generation variability. In addition, incremental solar generation costs can be imposed on the distribution system depending upon the inherent load profiles of a given distribution feeder and the level and location of solar generation along the feeder. The study methodology employed in the current study did not evaluate these types of solar integration costs.

B. Effective Load Carrying Capability Study Report for Solar Generation

Q. WHEN DID THE COMPANY LAST CONDUCT AN ELCC STUDY FOR SOLAR GENERATION?

A. The most recent solar ELCC study was conducted in 2013.

Q. WHY DID THE COMPANY DECIDE TO UPDATE THE SOLAR ELCC STUDY FOR THE 2016 ERP?

A. Even though the prior solar ELCC study was conducted fairly recently, the Company wanted to determine how solar ELCC is affected as incremental solar generation is added to the solar resource zones in Colorado where the Company's existing solar generation portfolio resides. In addition, it wanted to conduct a solar ELCC study concurrently with the wind ELCC study in order to determine if there are any beneficial impacts of wind on the solar ELCC results.

Q. IN GENERAL WHAT DID THE STUDY DETERMINE?

A. The current estimates of ELCC for existing levels of solar generation were mostly consistent with the results from the prior study. The study also determined the degradation that occurs with incremental additions of solar generation, and it documented the beneficial impacts of including wind and solar generation in the base portfolios when conducting solar and wind ELCC calculations, respectively.

Q. DID THE COMPANY UTILIZE THE RESULTS FROM THE PREVIOUS SOLAR ELCC STUDY IN THE 2011 ERP?

A. Yes. Estimates of solar ELCC values were used in the 2011 ERP Phase I alternative plans and in the 2011 ERP Phase II competitive acquisition.

Q. HOW DOES THE COMPANY PLAN TO UTILIZE THE RESULTS FROM THE UPDATED SOLAR ELCC STUDY IN THE 2016 ERP?

A. Estimates of ELCC values for the current solar portfolio are included on the Company's loads and resources tables. Estimates of ELCC to be afforded incremental solar generation are also shown on the loads and resources tables for the assumed levels of: 1) customer-choice solar shown in the Company's 2017 RES Plan, and 2) a 50 MW generator Solar*Connect solar generator in order to determine the level of generation capacity needed during the 8-year resource acquisition period. Finally, the study values will be used to set the capacity credit afforded to solar generation proposals evaluated in Phase II of the 2016 ERP.

C. Wind Integration Cost Studies

Q. WHEN DID THE COMPANY LAST CONDUCT AN INTEGRATION COST STUDY FOR WIND GENERATION?

A. The Company's most recent wind integration study was completed on August 19, 2011 and was entitled, "Public Service Company of Colorado 2 GW and 3 GW Wind Integration Cost Study" ("2 GW / 3 GW Study"). This study is provided for reference in Section 2.13 of Volume 2.

Q. HOW DO THE CURRENT AND PROPOSED LEVELS OF WIND GENERATION COMPARE TO THOSE IN THE 2 GW / 3 GW STUDY?

A. The Company's current wind portfolio is 2,556 MW. The Company has filed an application with the Commission for the 600 MW Rush Creek wind project. In addition, two existing wind purchase power agreements totaling 192 MW are currently scheduled to expire by early January 2019. If the Commission approves the Rush Creek Project, the Company's wind portfolio would be

between 2,964 MW and 3,156 MW, depending upon assumptions for the continuation of the two purchase power agreements. Assuming the Commission approves the 600 MW Rush Creek Project, the Company's wind generation portfolio will be at the top of the range studied or slightly beyond the top.

Q. HAS THE COMPANY OFFERED TO EXPAND THE EXISTING STUDY PAST THE 3 GW RANGE?

A. It has. In response to concerns regarding the 2 GW / 3 GW Study raised by the Commission's Trial Advocacy Staff in Proceeding 16A-0138E, the Company indicated that it would expand the existing study to examine: 1) a lower gas price than had been studied, and 2) higher levels of wind generation. The Company indicated that it would endeavor to file the expanded study report with the Commission at the time it filed its Rush Creek Wind Project application, or in a supplemental filing should the study report not be available at that time.

Q. DID THE COMPANY FILE AN EXPANDED WIND INTEGRATION COST STUDY REPORT WITH ITS RUSH CREEK WIND PROJECT APPLICATION?

A. It did not. The Company will file the study report in the 2016 ERP proceeding when it is complete, which is expected in June 2016. In the interest in avoiding duplicative litigation, the Company now believes it may be unnecessary to file the updated wind integration cost report in the Rush Creek proceeding, as the existing study provides wind integration costs for the

additional 600 MW of wind represented by the Rush Creek Wind Project.[1] The wind integration costs of incremental wind additions beyond the 600 MW of Rush Creek are appropriate to address in the 2016 ERP proceeding. In the event that the Commission does believe that it is appropriate to address the updated wind integration cost report in the Rush Creek wind proceeding, then it is possible that it might conclude that it is also appropriate to address the updated 30-Minute Flex Reserve study in that proceeding as well, as opposed to addressing it in this ERP proceeding.

Q. HOW HAS THE COMPANY UTILIZED THE RESULTS OF THE 2 GW / 3 GW STUDY IN THE 2016 ERP?

A. The Company used the results of the 2 GW / 3 GW Study in its analyses of the costs and benefits of the alternate plan portfolios presented in Volume 1 of this ERP. The Company assumed a linear extension of the results for the 2 GW and 3 GW cases for those alternate plans that included more than 3 GW of wind generation. For periods when forecast gas prices are below the minimum level studied, integration costs were based on the minimum gas prices studied (i.e. a gas price of $3.24/MMBtu).

Q. HOW DOES THE COMPANY EXPECT TO UTILIZE THE RESULTS OF ITS EXPANDED WIND INTEGRATION COST STUDY?

[1] The Company will make an appropriate filing in the Rush Creek Wind Project proceeding to inquire of the Commission's preference regarding whether the updated wind integration cost study should be filed in both the Rush Creek and ERP proceedings.

A. The Company intends to utilize the results of the expanded wind integration cost study to assign incremental wind generation costs to wind proposals received in the Phase II competitive solicitation during portfolio modeling.

D. 30-Minute Flex Reserves Study Expansion

Q. WHAT ARE 30-MINUTE FLEX RESERVES?

A. The Company has included in its transmission tariff a new service, Schedule 16: Flex Reserve Service. The Federal Energy Regulatory Commission ("FERC") issued a letter order on March 3, 2016 accepting the Company's new service schedule. This new service is a supplemental reserve category designed to address large reductions of online wind generation due to losses in wind speed. Flex Reserves are provided by electric generating resources that are available to generate electric energy and can be synchronized to the electric system within 30 minutes. This new 30-Minute Flex Reserve Service replaces the Company's prior 30-Minute Wind Reserve Guideline.

Q. HOW ARE 30-MINUTE FLEX RESERVES CALCULATED?

A. The Company has analyzed historic, 30-minute wind generation down ramps on its system. From an analysis of these wind down ramps it has determined the MW level of 30-minute responsive generation (i.e. the 30-Minute Flex Reserve) required for reliable operations as a function of wind generation levels. The details of how the Company calculates 30-Minute Flex Reserves are provided in the 30-Minute Flex Reserve study report, which is included for ease of reference in Volume 2 of the ERP. That study was also included in the Company's Rush Creek Wind Project application filed earlier this month.

Q. THE 30-MINUTE FLEX RESERVES STUDY REPORT REFERS TO "OFFLINE AND AVAILABLE" 30-MINUTE CAPABLE GENERATION. IS THIS THE ONLY CATEGORY OF 30-MINUTE CAPABLE GENERATION THAT CAN BE UTILIZED TO MEET THE 30-MINUTE FLEX RESERVE REQUIREMENTS?

A. No. The study report lists three categories of flexible resources that can be utilized to meet the requirements. Of these three categories, however, only "offline and available" 30-minute responsive generation is easily quantifiable outside of real-time operations. The study report in Volume 2 compares the maximum potential offline Flex Reserve generation to the Flex Reserve Requirements for the Company's existing wind generation portfolio (2,556 MW) and for wind portfolios of 2,974 MW and 3,174 MW. A wind portfolio level of 3,174 MW is consistent with an assumption of the current wind portfolio continuing plus an additional 600 MW of wind. The study assumed

this incremental 600 MW would be located near Limon, Colorado, consistent with the Company's proposed Rush Creek Project.

Q. WHAT DID THE STUDY DETERMINE AS TO THE COMPANY'S CURRENT LEVELS OF FLEX RESERVES TO ACCOMMODATE THE CURRENT WIND PORTFOLIO AND HIGHER WIND LEVELS?

A. The study found that the current portfolio of maximum potential offline Flex Reserve capacity is sufficient to reliably integrate the current level of wind and the higher levels of wind studied.

Q. CAN THE EXISTING LEVELS OF OFFLINE AND AVAILABLE FLEX RESERVE CAPACITY SUPPORT ADDITIONAL WIND GENERATION?

A. The study report included in Volume 2 studied incremental wind generation up to a total of 3,174 MW. The Company is currently working to expand the study to evaluate the impacts on Flex Reserve requirements for at least an additional 600 MW of wind, which would be a total wind portfolio level of 3,774 MW.

Q. WHEN DOES THE COMPANY ANTICIPATE THAT THE EXPANDED STUDY RESULTS WILL BE AVAILABLE?

A. The Company anticipates that it will have completed the study and will file a new study report in this proceeding in June 2016.

Q. GIVEN ITS CURRENT FLEX RESERVE CAPACITY LEVELS, CURRENT WIND PORTFOLIO, AND THE COMPANY'S RUSH CREEK PROJECT PROPOSAL, WILL THE COMPANY ACCEPT BIDS FOR INCREMENTAL WIND GENERATION IN A 2016 ERP PHASE II SOLICITATION?

A. Yes it will. If the expanded Flex Reserve study report indicates that incremental Flex Reserve capacity should be acquired to accommodate incremental wind generation, the Company would burden wind generation bids in the Phase II competitive solicitation with an estimate of these incremental Flex Reserve costs so as to compare the relative economic benefits of additional wind generation against their costs.

Q. DOES THE COMPANY ANTICIPATE THE NEED TO ACQUIRE INCREMENTAL FLEX GENERATION TO ACCOMMODATE INCREMENTAL SOLAR GENERATION?

A. No. At the current levels of installed solar, solar down ramps have not been an issue. The Company will continue to monitor generation patterns of wind and solar generation and their impact on the Company's operations. At installed solar levels in excess of what the Company would expect in the next few years, the need for additional Flex Reserves might arise. However, as the 30-Minute Flex Reserves study report indicates, the Company has multiple low-cost sources of incremental Flex Reserve capacity available.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Statement of Qualifications

Kent L. Scholl

I have a Bachelors of Science degree and a Masters of Science degree in Mechanical Engineering from the University of Minnesota and a Masters of Science degree in Finance from the University of Colorado at Denver. I am a licensed Professional Engineer in the State of Colorado. I have successfully passed all three exams required for the Chartered Financial Analyst designation, although I do not currently hold that designation.

I was employed at the National Renewable Energy Laboratory from 1990 – 1998 and, while there, conducted research in solar thermal and geothermal energy technologies.

I have been employed at Xcel Energy Services, Inc. for approximately fourteen years; first, as a Financial Engineer in the Risk Management department, then in the Resource Planning and Acquisition department as a Purchased Power Analyst, as a Business Analyst, and currently as a Senior Resource Planning Analyst.

As a Senior Resource Planning Analyst, I am responsible for the quantitative and non-quantitative analysis of proposed capacity and energy additions and proposed wholesale purchase and sales transactions across all of Xcel Energy's utilities with primary responsibilities on the Public Service Company of Colorado system. I was the RFP Manager for the 2008 Solar Resource RFP and the 2013 All-Source Solicitation.

I have testified before the Colorado Public Utilities Commission in prior resource planning and renewable energy standard compliance plan dockets.