**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 2020-2021 RENEWABLE ENERGY COMPLIANCE PLAN** | ) ) ) ) ) ) | **PROCEEDING NO. 19A-XXXXE** |

**<u>DIRECT TESTIMONY AND ATTACHMENT OF ALEXANDER G. TROWBRIDGE</u>**

**ON**

**BEHALF OF**

**PUBLIC SERVICE COMPANY OF COLORADO**

**June 28, 2019**

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

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## GLOSSARY OF ACRONYMS AND DEFINED TERMS

| Acronyms/Defined Term | Meaning |
|---|---|
| 2016 ERP | Proceeding No. 16A-0396E, Public Service's 2019 Electric Resource Plan |
| 2020-21 RE Plan, RE Plan, Plan, or Compliance Plan | Public Service's 2020-2021 Renewable Energy Compliance Plan |
| AD/RR | Proceeding No. 17A-0797E, Public Service's Application for Accelerated Depreciation and RESA Reduction |
| DG | Distributed Generation |
| ECA | Electric Commodity Adjustment |
| ERP | Electric Resource Plan |
| Retail DG | Retail Distributed Generation |
| MW | Megawatt |
| No RES Plan | Company's Plan to acquire only non-renewable resources |
| Non-DG | Non Distributed Generation |
| Public Service or Company | Public Service Company of Colorado |
| QRU | Qualified Retail Utility |
| RE | Renewable Energy |
| REC | Renewable Energy Credit |
| RES | Renewable Energy Standard |
| RES Plan | Renewable Energy Standard Plan |
| RESA | Renewable Energy Standard Adjustment |
| Schedule RE | Recycled Energy Service |

| **Acronyms/Defined Term** | **Meaning** |
|---|---|
| Wholesale DG | Wholesale Distributed Generation |
| Xcel Energy | Xcel Energy Inc. |

**BEFORE THE PUBLIC UTILITIES COMMISSION**
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## DIRECT TESTIMONY AND ATTACHMENT OF ALEXANDER G. TROWBRIDGE

## I. INTRODUCTION AND PURPOSE OF TESTIMONY

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

A. My name is Alexander G. Trowbridge. My business address is 1800 Larimer Street, Denver, Colorado 80202.

**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. PLEASE SUMMARIZE YOUR RESPONSIBILITIES AND QUALIFICATIONS.**

I am employed by Public Service as a Principal Pricing Analyst in the Pricing and Planning Department. I am responsible for development of new rate design proposals or modifications to existing rates to ensure effective price structures, increased options for customers, and compliance with regulatory requirements. A description of my qualifications, duties and responsibilities is included in my Statement of Qualifications at the end of my testimony.

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

A. The purpose of my testimony is to provide support for two sections of the Company's 2020-2021 Renewable Energy Plan ("2020-21 RE Plan" or "Plan"): Section 5 as it relates to Non-Distributed Generation ("DG") and Wholesale DG resources and Section 7, where I explain the calculation of the Retail Rate Impact. I describe the modeling assumptions for the Strategist model runs that are used to calculate the incremental costs of certain Eligible Energy Resources, and present and provide the support for Tables 7-1 through 7-3. Next, I explain that as a result of the 2016 Electric Resource Plan ("2016 ERP") process in Proceeding No. 16A-0396E, the Commission has approved the acquisition of an additional 707 MW of utility scale solar generation and 1,131 MW of wind generation and that these resources have been included in the Renewable Energy Standard Adjustment ("RESA") deferred balance projection included in Table 7-3(c). I present the incremental costs of the majority of the existing Eligible Energy Resources that were previously locked down by Commission orders, and which are being unlocked within this 2020-21 RE Plan. I explain that the 2020-21 RE Plan examines the incremental cost of the Company's renewable energy portfolio, including the incremental cost of unlocked segments of the Company's overall renewable energy portfolio, which is then set for the term of the 2020-21 RE Plan. Finally, consistent with the Commission-approved Settlement Agreement in the Company's 2017-19 RE Plan, I explain the modeling inputs used in the calculation of the incremental cost of the Company's renewable energy portfolio under an unlocked scenario.

**Q. ARE YOU SPONSORING ANY ATTACHMENTS AS PART OF YOUR DIRECT TESTIMONY?**

A. Yes. I am sponsoring Attachment AGT-1, which contains a summary of "Locked" Eligible Energy Resources.

## II. <u>ACQUISITION OF NON-DG AND WHOLESALE DG RESOURCES</u>

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

A. In this section of my Direct Testimony, I explain that the Company does not intend to acquire any additional Eligible Energy Resources that are wholesale or Non-DG Resources under this Plan.

**Q. IS THE COMPANY REQUESTING AUTHORIZATION TO ACQUIRE ADDITIONAL WHOLESALE DG OR NON-DG RESOURCES UNDER THIS 2020-21 RE PLAN?**

A. No, it is not. As discussed in the direct testimony of Mr. Jack W. Ihle and Kerry R. Klemm, the Company has acquired sufficient Retail and Wholesale DG resources to meet its Renewable Energy Standard ("RES") compliance requirements.

## III. RETAIL RATE IMPACT BACKGROUND

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

A. In this section of my Direct Testimony, I summarize the retail rate impact for the Company's customers and explain the RES modeling required pursuant to the Commission's Rules. I then explain how the Company performed this modeling, which is presented in Section 7 of the Company's 2020-21 RE Plan.

**Q. PLEASE SUMMARIZE THE RETAIL RATE IMPACTS FOR PUBLIC SERVICE'S CUSTOMERS.**

A. As required by both Commission Rule 3661 and C.R.S. § 40-2-124(1)(g)(I), Public Service has completed a retail rate impact analysis. Beginning in January 2009, the RESA was increased to 2 percent pursuant to Decision No. C08-0203.[1] The revenues collected by the RESA are used to cover the incremental costs of eligible energy resources and program administration costs. As described later in my testimony, the Company plans to reduce the RESA to a collection level of 1 percent per the terms of Commission Decision No. C18-0762 issued in the Company's Accelerated Depreciation/RESA Reduction ("AD/RR") Proceeding (Proceeding No. 17A-0797E).[2]

**Q. DOES THE COMPANY PROPOSE TO MAINTAIN THE CURRENT ALLOCATION OF COST RECOVERY FOR RENEWABLES BETWEEN THE ELECTRIC COMMODITY ADJUSTMENT ("ECA") AND RESA?**

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[1] Proceeding No. 08L-056E, Decision No. C08-0203 (mailed Feb. 28, 2008).
[2] Proceeding No. 17A-0797E, Decision No. C18-0762, ordering ¶ 4 (mailed Sept. 10, 2018)

A. Yes. Public Service plans to use the same cost recovery mechanisms for our 2020-21 RE Plan that the Commission approved for prior Compliance Plans;[3] namely: (1) the ECA to recover the costs of Eligible Energy that match the costs of the avoided non-renewable resources; and (2) the RESA to recover: (a) Eligible Energy costs that are incremental to the costs of the avoided non-renewable resources; and (b) the program and administration costs. Included in the calculation of costs paid for by the ECA is an equivalent avoided cost for the solar production from our Solar*Rewards® systems. Because the Solar*Rewards® costs are charged to the RESA a separate calculation of the avoided costs equivalent to the production is performed and these costs are charged against the ECA and credited to the RESA.

**Q. HAS THE COMPANY ALWAYS ALLOCATED THE SOLAR*REWARDS® AVOIDED COSTS TO THE ECA?**

A. Yes. Since the very first RES Compliance Plan, Proceeding No. 06A-478E, the Company has provided to the Commission a forecast of incremental costs as well as the amount of costs to be charged to the ECA. The Commission first approved this allocation incremental costs of in Decision No. C07-0676.

**Q. PLEASE DESCRIBE THE RES MODELING REQUIRED UNDER COMMISSION RULE 3661.**

[3] The Commission approved this cost recovery mechanism in Decision No. C09-1037 in Proceeding No. 08A-532E, R10-0586 (Proceeding No. 09A-772E), C10-1033 (Proceeding No. 09A-772E), and C12-0606 (Proceeding No. 11A-418E) and reaffirmed it in Decision Nos. R14-0902 and C14-1505 (Proceeding No. 13A-0836E).

A. Section 7 of the Company's 2020-21 RE Plan discusses the modeling requirements in more detail. However, at a high level, Rule 3661 requires that Public Service quantify the incremental cost of its Eligible Energy Resources and to test whether the Plan meets the requirements of the retail rate impact set forth in statute and Commission Rule 3661.

**Q. HOW DOES THE COMPANY QUANTIFY THE INCREMENTAL COST OF ITS ELIGIBLE ENERGY RESOURCES?**

A. Consistent with Rule 3661, the Company's modeling provides a comparison of two alternative future paths—one in which the Company acquires renewable resources to meet the State's Renewable Energy Standard (the "RES Plan" scenario) and a second path where the Company acquires only non-renewable resources (the "No RES Plan" scenario) to meet Public Service's resource need. As explained in more detail below, the No RES Plan includes existing renewable resources that are behind the "time fence" (which I explain in more detail below) and existing renewable resources during the period that are "locked down." The cost difference between these two paths is the incremental cost of acquiring eligible energy resources to meet, or exceed, Colorado's RES. Commission Rule 3661(h) provides the basic method for developing the estimate of the retail rate impact cap.

**Q. WHERE IN THE COMPLIANCE PLAN IS THE RETAIL RATE IMPACT PRESENTED?**

A. Attachment JWI-1, Section 7, and Attachment JWI-2, Tables 7-1 through 7-3 of the 2020-21 RE Plan, contains a summary of the output information obtained from the model runs used to calculate the incremental cost differences between the RES Plan and the No RES Plan. These cost analyses are used to determine the overall retail rate impact of acquiring these resources to meet or exceed Colorado's RES. The Company is using the same modeling assumptions as compared to what was filed for the RES and No RES plans with the 2016 ERP Plan approved by Commission Decision No. C18-0761.

**Q. PLEASE EXPLAIN HOW THE COMPANY PERFORMED ITS COST ANALYSES PRESENTED IN THE 2020-21 RE PLAN.**

A. The Company uses a proprietary model called Strategist to develop the cost analyses used to prepare its RES compliance plans, including the development of the RES and No RES plans. Strategist serves two main functions. First, it is an expansion planning model, which means that it takes a set of available generation resources and creates a series of potential future paths by assembling different combinations of the available resources. Each of these potential paths will be able to serve forecasted energy demand while meeting certain reliability measures. Second, it quantifies the cost of these different combinations by calculating both the production costs to serve energy loads (e.g. fuel and purchased power costs), and the incremental costs for capacity (e.g. payments under a purchased power agreement or the cost of owning a power plant). Using Strategist allows the Company to develop a range of alternatives and sensitivities to evaluate bids received when the Company conducts its solicitations for power supply.

**Q. DOES THE STRATEGIST MODEL SIMULATE THE OPERATION OF THE COMPANY'S ELECTRIC SYSTEM TO CALCULATE PRODUCTION COSTS?**

A. Yes. Strategist uses a series of algorithms and input variables to mimic real time system operation. Strategist performs the basic functions of unit commitment and dispatch using the same principles used in real time system operation.

**Q. DOES STRATEGIST CALCULATE OTHER COSTS ASSOCIATED WITH GENERATION DECISIONS?**

A. Yes. In addition to production costs, Strategist will summarize the cost of fixed payments under purchased power agreements and the cost of new utility owned resources, so that the cost of plans can be compared to each other. For example, this allows the Company to compare resource additions that on one hand might have high fixed costs and low variable costs to resource additions that have low fixed costs and high variable costs.

**Q. IS THE COMPANY PRESENTING THE SAME TIME PERIODS AS WERE PRESENTED IN THE 2016 ERP PLAN 120-DAY REPORT?**

A. No. Under its 2020-21 RE Plan, the Company is presenting the ten-year period from 2019-2029, consistent with Rule 3661(f). The 120-Day Report filed in the

ERP presented forecasted incremental costs through 2026 consistent with the 2017 RE plan.[4]

**Q. DO ALL OF THE RES RESOURCES UTILIZE MODELING ASSUMPTIONS FROM THE SPRING 2019 LOAD AND GAS PRICE FORECAST?**

A. No. As I describe in more detail later in my testimony, the modeling assumptions for certain resources have been either locked for life, or they have been locked for a certain time period based on previous Commission order. Attachment AGT-1 summarizes which resources have locked incremental cost assumptions and for what period of time those assumptions are protected.

**Q. GENERALLY, WHAT IS THE RATIONALE FOR LOCKING INCREMENTAL COSTS FOR A FIXED PERIOD OF TIME?**

A. The purpose of locking down costs is to provide customers and the utility with some certainty as to the accounting treatment of the incremental costs of resources already acquired that will be charged against the ECA and RESA accounts during the lock-down years. This certainty facilitates planning for the acquisition of additional renewable resources.

**Q. HAS THE COMPANY COMMITTED TO ACQUIRING ADDITIONAL RESOURCES BEYOND THOSE AGREED TO IN THE 2017-19 RE PLAN SETTLEMENT AGREEMENT?**

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[4] *See* Proceeding No. 16A-0396E, Public Service Company of Colorado 2016 Electric Resource Plan 120-Day Report (filed June 6, 2018).

A. Yes. As a result of the 2016 ERP process, the Commission has approved the acquisition of an additional 707 MW of utility scale solar generation and 1,131 MW of wind generation.

| Resource | Project Number |
|---|---|
| 250MW Solar | **X645** |
| 200 MW Solar | **X647** |
| 110 MW Solar | **X427** |
| 75MW Solar | **S430** |
| 72MW Solar | **S085** |
| 500MW Wind | **W192** |
| 300MW Wind | **W602** |
| 169MW Wind | **W090** |
| 162MW Wind | **W301** |

All of these resources[5] have been included in the RESA deferred balance projection included in Attachment JWI-2, Table 7-3 (a) and Table 7-3 (c).

**Q. PLEASE DESCRIBE THE RESOURCES INCLUDED IN THE MODEL RUNS FOR THE RES PLAN AND THE NO RES PLAN SCENARIOS.**

A. As mentioned above, the cost impact of a number of eligible energy resources has been set at a specified cost rate for various periods of time, and therefore these resources are considered to be “locked down” for a period of time for the purpose of developing the RES Plan and No RES Plan. For the period that the costs of these resources are “locked down,” these resources are included in both the RES and No RES Plan scenarios and therefore result in the same costs in

[5] The Company has identified a need to re-bid Projects X427 and S430 which is an ongoing subject of Proceeding No.16A-0396E. However, for the purpose of portfolio modeling at this time, the Company will use pricing from these bids as indicative.

both model runs and do not generate a cost difference between the two model runs. As a result, only those eligible energy resources that have not been locked down are included in the RES Plan scenario and not included in the No RES Plan scenario. Attachment AGT-1 includes a list of all the eligible energy resources whose incremental costs are collected through the RESA, and demonstrates which resources are locked down by previous Commission orders, and for what period.

**Q. ARE THE LOCKED RESOURCES THE SAME AS THE RESOURCES BEHIND THE TIME FENCE?**

A. No. There are three different treatments of eligible energy resources: (1) those that are behind the time fence; (2) those whose incremental costs were locked down for some period of time by Commission order; and (3) those whose incremental costs are calculated through updated modeling performed in this 2020-21 RE Plan filing.

**Q. PLEASE PROVIDE MORE INFORMATION ON THE RESOURCES THAT ARE INCLUDED IN BOTH THE RES AND NO RES PLAN SCENARIOS OR BEHIND THE TIME FENCE.**

A. Two categories of resources are included in both the RES and No RES Plan scenarios. The cost impact of these locked resources is shown on Attachment JWI-2, Table 7-2(b). The first category of resources included in both the RES and No RES Plan scenarios are those resources behind what is called the "time fence." In accordance with Commission rules and decisions, resources acquired before July 2, 2006 are considered behind the Commission-created "time fence," i.e., the costs of these resources are considered "sunk" and are included in both the RES and No RES Plan scenarios. As a result, these costs are not included in the calculation of the incremental costs of renewable energy.[6] These resources include Company-owned hydroelectric plants, a waste to energy facility, and certain wind resources (Cedar Creek I, Colorado Green, Foote Creek, Logan, Peetz, Spring Canyon, and Twin Buttes).

The second category of resources included in both the RES and No RES Plan scenarios are resources explicitly locked down by Commission order. A list of all resources that have been locked down by previous Commission orders is provided in Attachment AGT-1.

**Q. PLEASE EXPLAIN HOW THE "LOCKED DOWN" COSTS ARE INCLUDED IN THE DATA PRESENTED IN TABLES 7-1 TO 7-3 OF ATTACHMENT JWI-2.**

A. "Locked down" incremental costs means that the Commission has identified a specific $/MWh rate or total annual incremental cost for a specific resource for a specific period of time, and that these incremental cost calculations are "locked down" and not revisited or re-determined in a RES compliance plan filing until the lock down period expires.[7] The purpose of the lock-down rule is to provide the customers and utility with some certainty as to the accounting treatment of the incremental costs of resources already acquired that will be charged against the ECA and RESA accounts during the lock-down years, thereby facilitating

[6] *See* Commission Rule 4 CCR 723-3-3661(h)(III).
[7] *See* Commission Rule 4 CCR 723-3-3661(h)(V).

planning for the acquisition of additional renewable resources. There are two eligible energy resources which are locked down for the life of the resource: SunE Alamosa and an early portion of the Company's Solar*Rewards® capacity.[8]

**Q. WHEN ARE THE "LOCKED DOWN" INCREMENTAL COSTS EXPECTED TO EXPIRE?**

A. There are three groups of resources: Group (1) Locked-for-life, the two eligible energy resources which are locked down for the life of the resource; Group (2) those resources whose incremental costs have been locked through 2026; and, Group (3) the new resources added through the 2016 ERP as part of the approved Colorado Energy Plan Portfolio. For Group 3 resources identified in Attachment AGT-1, the "locked down" period is set by Commission Rule 3661(h)(VI) to end upon a final Commission decision in this 2020-21 RE Plan.[9] Since we do not know when the Company will receive a final Commission decision regarding this 2020-21 RE Plan, we have assumed that the "locked down" period for these resources will expire on December 31, 2021. As a result, only Group 3 energy resources contemplated by Commission Rule 3661 will be unlocked for the entire period of the 2020-21 RE Plan. Consistent with Commission Rule 3661(h)(V), all eligible energy resources that are unlocked will

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[8] Proceeding 08A-532E, Decision No. C09-1037, ¶ 43 (mailed Sept. 17, 2009).

[9] Commission Rule 3661(h)(VI) states "…On-going annual net incremental costs locked down before October 31, 2015 shall not be reset until the Commission issues a final decision regarding the investor owned QRU's compliance plan filed on or before October 31, 2015". Commission Decision C15-0925, in Proceeding 15V-0473E, granted the Company a delay in filing this compliance plan from the original filing date of October 31, 2015 to February 29, 2016.

have their incremental costs set for the term of the 2020-21 RE Plan, and will not be recalculated until the implementation of the next RE Plan. The result of this unlocking of incremental costs is represented in Attachment JWI-2, Tables 7-1 through 7-3.

**Q. IS THE COMPANY REQUESTING AN EXPLICIT "LOCK DOWN" OF THE INCREMENTAL COSTS OF ANY ELIGIBLE ENERGY RESOURCES BEYOND THE PERIOD CONTEMPLATED BY THIS 2020-21 RE PLAN?**

A. No.

**Q. WHAT ARE THE RESULTS OF THE COMPANY'S STUDY OF THE RETAIL RATE IMPACT OF ITS ACQUISITION OF ELIGIBLE ENERGY RESOURCES?**

A. Column V of Table 7-2(c) (RESA Rolling Balance – Deferred) demonstrates that the RESA balance was positive at the end of 2018 by approximately $48 million. The positive RESA deferred balance is expected to decrease to approximately $46 million by 2021. After 2021, the RESA deferred balance is expected to stabilize and grow under the assumption that natural gas prices will also increase. This continued growth is largely attributable to many of the locked down resources continuing to contribute little incremental costs to the RESA, as well as the benefit associated with planned resource additions added through the 2016 ERP. The Company forecasts that beginning in 2023, with a large portion of the eligible RES portfolio locked through 2026, the modeled incremental costs of the portfolio to the RESA are negated entirely. This continued growth of the RESA deferred balance also reflects an assumption of no additional acquisitions of eligible energy resources except for continued growth of the Solar*Rewards® and Solar*Rewards Community® programs. The Company's projections incorporate the RESA 2 percent level of Rider recovery being reduced to 1 percent being in 2021.

**Q. HOW DO YOU PROJECT THE COMMISSION'S DECISION APPROVING THE SETTLEMENT AGREEMENT IN PROCEEDING NO. 17A-0797E, THE COMPANY'S AD/RR APPLICATION, WILL IMPACT THE RESA DEFERRED ACCOUNT BALANCE IN 2020-2021?**

A. Public Service filed its AD/RR application on November 28, 2017 requesting: (1) that the Commission approve an adjustment to the depreciation schedules for the Company's Comanche 1 and 2 generation facilities and the creation of a regulatory asset to collect incremental depreciation costs aligned with the early retirement dates set forth in the Colorado Energy Plan Portfolio; and (2) a reduction in the RESA from 2 percent to 1 percent effective in 2021. The Company is incorporating the 1 percent RESA rider reduction in 2021 as was contemplated AD/RR proceeding[10]. Based on the current RESA rider revenue forecast, a 1 percent RESA rider would result in approximately $27 million in RESA revenues.

**Q. GIVEN THAT THE COMPANY EXPECTS THE RESA DEFERRED BALANCE TO BE AT $55 MILLION UNDER THE 2 PERCENT LEVEL OF COLLECTION**

[10] Proceeding 17A-0797E, Decision No. C18-0762, ¶ 29 (mailed Sept. 10, 2018).

**BY THE END OF 2020, IS THE COMPANY CONSIDERING REDUCING THE 2 PERCENT RESA RIDER TO 1 PERCENT EARLIER THAN 2021?**

A. While the Company is forecasting a sufficient RESA deferred balance to reduce the RESA rider to 1 percent starting in 2020 (as opposed to January 1, 2021), the Company is not prepared to commit to an earlier RESA reduction at this time. Implementing the RESA reduction one year earlier (in 2020) would reduce the RESA deferred account balance by approximately $26 million, which means that the current forecast for 2020 would still result in approximately $29 million of head room before the RESA deferred would become negative.

**Q. WILL A CHANGE IN NATURAL GAS PRICES OR OTHER MARKET CHANGES IMPACT THE RESA DEFERRED ACCOUNT BALANCE DURING THE YEARS OF 2020 THROUGH 2021?**

A. A change in gas prices or other market assumptions will not have a material impact on the RESA deferred account balance in the years 2020 through 2021. This is because under Commission Rule 3661(h)(V), the Company will not recalculate the incremental costs of the eligible energy resources until the Company files its next RE Plan. Although fuel prices will drive the level of RESA funding, based upon the calculation of the 2 percent RESA rider, the only other variable that could impact the RESA deferred account balance through 2021 is the actual level of production from each of the renewable energy facilities. To the extent the incremental cost of eligible energy resources is calculated on a per unit basis ($/MWh) and is not recalculated using different assumptions during the period of the RE Plan, the only variable that is not set for the RE Plan period is the actual generation quantity. As a result, the projections of the RESA deferred balance shown on Attachment JWI-2, Table 7-2(c) through 2021 should be reasonably accurate, absent additional changes to the Company's renewable resource portfolio over the RE Plan period.

**Q. PLEASE SUMMARIZE THE PURPOSE OF THE OTHER TABLES INCLUDED IN VOLUME 2 OF THE 2020-21 RE PLAN (ATTACHMENT JWI-2), AND EXPLAIN THE INFORMATION PRESENTED IN THE TABLES.**

A. In an effort to increase the transparency and the clarity surrounding the complex RESA deferred balance calculations, Tables 7-1 through 7-3 present various details supporting the summary Table 7-3(c). The tables were designed to make certain information explicit: the total cost of the eligible energy resources; the incremental portion of the total costs of the eligible energy resources that is recoverable through the RESA; and, the avoided energy costs of the eligible energy resources that is recoverable through the ECA. All columns and costs that contain red text have been locked down by Commission order.

Table 7-1 is a summary of the total of both the unlocked and locked costs of eligible resource costs that are charged to the RESA deferred account. These costs are separated into their incremental cost (RESA charges) and avoided energy cost components (ECA charges). The columns that contain the word "unlocked" in the column heading contain the costs for eligible energy resources which have not had their respective costs locked by Commission order. The columns that contain the word "locked" in the column heading contain the costs for eligible energy resources which have had their costs locked by Commission order. If a resource had its costs locked for a finite period of time (e.g. not for the life of the resource) its costs will shift from the locked columns to the unlocked columns once the lock down period for that resource has expired.

**Q. PLEASE DESCRIBE EACH OF THE COLUMNS SET FORTH IN TABLE 7-1 OF ATTACHMENT JWI-2.**

A. The column labeled "Total Renewable Energy Costs" sets forth by year the contracted or estimated total costs of the renewable resources in question. The unlocked incremental costs are calculated from the difference between the total modeled system costs of the RES and No RES Plan scenarios. The locked incremental costs are the locked down incremental costs of the locked renewable resources as set by Commission order. Incremental costs are the additional costs above the avoided costs of the renewable resources which are recoverable through the RESA. The avoided costs are the modeled or locked "benefits" of the renewable resources which are recovered through the ECA.

**Q. PLEASE DESCRIBE EACH OF THE COLUMNS IN TABLES 7-2(A) AND (B) OF ATTACHMENT JWI-2.**

A. Table 7-2(a) provides the calculations for the incremental and avoided costs of the unlocked resources. Tables 7-2(a) and (b) contain identical calculations, the difference being 7-2(a) only contemplates unlocked resources and 7-2(b) only contemplates locked resources. Tables 7-2(a) and (b) are discussed in Section 7, but I will provide an overview of each column of these tables below.

- Columns B through D represent the total cost of renewable resources that are "unlocked", meaning their costs have not been locked down by previous proceedings and have been included in the RES but not the No RES comparison. These costs do not include the costs of the Solar*Rewards® program, which are identified separately in the Table.
- Column E, "Total Cost", is the summation of the costs shown in columns B through D.
- Column F, "B, C, D Modeled Incremental Cost", is the modeled incremental cost (difference between system costs of the RES and No RES Plans) of the resources contained in columns B, C and D, and is recovered through the RESA.
- Column G, "B, C, D Calculated Avoided Cost", is the calculated avoided cost, or benefits, of the resources contained in columns B, C and D, and is calculated by subtracting the incremental cost in column F from the total cost in column E.
- Column H, "On-Site Solar Total Cost", is the total estimated cost of the Solar*Rewards® and Solar*Rewards Community® programs. Column H in Table 7-2(a) contemplates the unlocked tranches of Solar*Rewards®, and Column H in Table 7-2(b) contemplates the locked tranches of the Solar*Rewards® program.
- Column I, "Modeled On-Site Solar Avoided Cost", is the modeled avoided costs of the On-Site Solar resources included in Column H. This is determined from the sum of modeled "benefits" or avoided costs calculated from a RES and No RES Plan

comparison which only considers the Solar*Rewards® and Solar*Rewards Community® in question. For Table 7-2(b), the modeled avoided costs are for the tranches of Solar*Rewards® that were locked by Commission order, and therefore were determined from the approved modeling assumptions used at the time their respective costs were locked. The locked avoided costs for the two tranches of Solar*Rewards® which have their incremental costs locked are detailed in Tables 7-3(a) and (b).

- Column J, “Calculated On-Site Solar Incremental Cost”, is the calculated incremental cost of the Solar*Rewards® and Solar*Rewards Community® tranches contained in Column H, and is calculated by subtracting the avoided cost in column I from the total cost in Column H.
- Column K, “Total Costs”, is a sum of the total costs of resources from columns F and H. For Table 7-2(a) this is the total cost of unlocked resources, for Table 7-2(b) this is the total cost of locked resources.
- Column L, “Incremental Costs”, is a sum of the incremental costs of resources from columns F and J. For Table 7-2(a) this is the incremental cost of unlocked resources, for Table 7-2(b) this is the incremental cost of locked resources (as set by Commission Order).
- Column M, “Avoided Costs”, is a sum of the avoided costs of resources from columns G and I. For Table 7-2(a) this is the avoided cost of unlocked resources; for Table 7-2(b) this is the avoided cost of locked resources.

**Q. PLEASE DESCRIBE EACH OF THE COLUMNS SET FORTH IN TABLE 7-2(C).**

A. Table 7-2(c) is a summary which pulls together the components from Tables 7-2(a) and (b) and ultimately calculates the impact to the RESA account. Although a discussion of the various columns on Tables 7-2(c) are included in Section 7 of Attachment JWI-1, I provide a high level overview of this table below:

- Columns B and C represent the total estimated cost of renewable resources that have their incremental costs collected by the RESA. Column B contains the total cost of unlocked resources and column C contains the total cost of locked resources.
- Columns D and E are the incremental costs of resources which are recoverable through the RESA.
- Column F contains the Program and Administration costs recoverable by the RESA rider.
- Columns G through J are estimates of the various sources of revenue to pay for costs borne by the RESA; this includes RESA rider revenue (currently 2 percent of customer bills), estimated Windsource® revenue, projected Hybrid Renewable Energy Credit ("REC") Margins (if any) and estimated Wholesale Customer share of incremental renewable resource costs. Consistent with Rule 3660(l) the Company is required to offer our full requirements wholesale customers a load ratio share of the RECs commensurate with their service so long as they reimburse the Company for the cost of the resource and administrative responsibilities for such transactions

which are performed consistent with our Federal Energy Regulatory Commission-approved contracts.

- Columns K and L are the avoided cost portions of the renewable resources cost. These costs are collected by the ECA and do not factor into the calculation of the RESA balance, they are provided for informational purposes only.
- Column P is a sum of the total estimated renewable resource costs. The incremental portions of these costs are collected by the RESA, and the avoided portion is collected by the ECA.
- Column Q is a sum of all costs to be recovered through the RESA. This includes the incremental costs of locked and unlocked resources as well as RESA program administration costs.
- Column R is a sum of all revenues used to pay for the costs borne by the RESA.
- Columns S, T, U, and V include the annual excess or deficiency calculation (calculated from the difference of columns O and N), the interest calculations for the deferred balance, and the RESA rolling balance calculations.

**Q. PLEASE DESCRIBE TABLES 7-3(A) AND (B).**

A. Table 7-3(a) provides a summary of the locked for life incremental costs for resources that transfer their incremental costs from the ECA to the RESA, and the locked for life avoided costs for resources that transfer their avoided costs from the RESA to the ECA (Solar*Rewards® pre-2009). Table 7-3(b) provides the same information, but in greater detail with full calculations.

**Q. IS THE COMPANY PRESENTING AN UNLOCKED ANALYSIS OF INCREMENTAL COSTS FOR ITS 2020-21 RE PLAN?**

A. Yes. The Settlement Agreement addressing the Company's 2017-19 RE Plan provided:

> In addition to its required RES/No RES reporting, in its next RE Plan filing, the Company will present a comparison of the RES/No RES cost analysis of the locked down resources as set through this Settlement, to a RES/No RES analysis based on market conditions at the time of the next RE Plan filing.[11]

Although the Company has not historically presented an analysis of the incremental cost of locked resources based on updated modeling assumptions, the Company has provided this analysis in Table 7-2(d).

**Q. EXPLAIN THE MODELING INPUTS USED IN THE CALCULATION OF THE INCREMENTAL COST OF THE COMPANY'S RENEWABLE ENERGY PORTFOLIO UNDER AN UNLOCKED SCENARIO FOR GROUP B RESOURCES AND HOW THEY DIFFER FROM THE LOCKED SCENARIO.**

**Q.** Incremental and avoided costs attributable to Group B resources were locked for the 10-year period of 2017-2026 via Commission approval of the Settlement Agreement addressing the Company's 2017-19 RE Plan. The locked incremental and avoided costs incorporated a spring 2016 gas price forecast and a fall 2015 load forecast. The unlocked scenario incorporates a spring 2019 gas and load forecast. The primary difference between the two scenarios is that the gas price forecast has declined relatively significantly since the spring of 2016. That

[11] Proceeding Nos. 16AL-0048E. 16A-0055E, 16A-0139E. Corrected Non-Unanimous Comprehensive Settlement Agreement, p. 75 (filed Sept. 27, 2019).

decline has the effect of lowering the modeled avoided cost and therefore increasing the incremental cost of the Group B resources**.**

**Q. DOES THE COMPANY SUPPORT MAINTAINING THE LOCK DOWN PROCESS FOR INCREMENTAL COST MODELING?**

A. Yes, it does. The Company maintains that the purpose of this lock down process is to better project the cost impacts of incremental eligible energy resources on the RESA over time. This improved certainty regarding the RESA impact of eligible energy resources gives the Commission the opportunity to better understand, and be able to adequately plan for new renewable resources and the cost impacts to customers.

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

A. Yes, it does.

**Statement of Qualifications**

**Alexander G. Trowbridge**

I have a Bachelor of Arts degree with a major in Accounting from Fort Lewis College in Durango, Colorado. Additionally, I am a Certified Public Accountant and maintain an active license in the State of Colorado.

I began my career in public accounting (1999–2005), working for the “Big 4” firms including Deloitte & Touche in Denver, Colorado and Los Angeles, California. Through my roles in Public Accounting, I have led the audit of various Fortune 500 Companies, and participated in PCAOB Audit and SEC investigation activities. My public accounting industry experience includes Manufacturing, Real Estate, Construction, Insurance, Banking, and Investing.

Following six years in public accounting, I was employed by Sun Microsystems (2005–2009), first as a Technical Lead and Senior Financial Analyst responsible for technical research and financial modeling support related to acquisition and divesture activity, and later as the company’s SEC Reporting Manager; responsible to supervise the preparation of the SEC financial statements.

In May 2009, I was hired by Xcel Energy as a Principal Financial Consultant in the Transaction Enablement Accounting and Reporting group within the Utility Accounting organization. My principal duties were to evaluate all commercial contracts for lease, variable interest entity, derivative, and/or other technical accounting implications. I was responsible for developing accounting policies and documentation related to new transactions and/or the implementation of new or revised accounting standards. In October 2012, I accepted a rotational position in the Controller's organization. In that role, I served as the interim Manager of Financial Reporting, and the Manager of Regulatory Accounting for Public Service Company of Colorado. Through those roles, I developed an in-depth knowledge of existing recovery mechanisms at Public Service Company and have successfully led teams through the issuance of Company financial statements including, SEC and FERC forms. In August 2014, I accepted the Principal Pricing Analyst position working for the Rates and Regulatory Affairs organization in Public Service Company. In this role, I am responsible for development of new rate design proposals or modifications to existing rates to ensure effective price structures, increased options for customers, and compliance with regulatory requirements.