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 2024-2028 CLEAN HEAT PLAN.	**)** **)** **)** **)**	**PROCEEDING NO. 23A-0392EG**

DIRECT TESTIMONY AND ATTACHMENTS OF LAUREN W. QUILLIAN
ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

August 1, 2023

BEFORE THE PUBLIC UTILITIES COMMISSION
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I. INTRODUCTION, QUALIFICATIONS, PURPOSE OF TESTIMONY, AND RECOMMENDATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Lauren W. Quillian. My business address is 1800 Larimer Street, Denver, Colorado 80202.

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

A. I am employed by Public Service Company of Colorado ("Public Service" or the "Company") as the Director of Energy and Environmental Policy.

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

A. I am testifying on behalf of Public Service.

Q. PLEASE SUMMARIZE YOUR RESPONSIBILITIES AND QUALIFICATIONS.

A. I am responsible for advising Xcel Energy Operating Companies on state and federal energy and environmental policy, including climate related topics, and developing and implementing our sustainability efforts. I have over 10 years' experience in energy policy at Xcel Energy, including involvement in many Colorado policy issues and proceedings. I previously worked the international

development field for 4 years prior. I hold a Bachelor's in Spanish and Foreign Affairs from the University of Virginia and a Master's in public administration from Columbia University.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A The purpose of my Direct Testimony is to provide context for the greenhouse gas emissions reductions achieved in the Company's proposed Clean Heat portfolios. I explain how the emissions reductions represented in the portfolios are contributing to the broader statewide emissions reduction goals in Colorado. I also explain how the Company's proposed Clean Heat portfolios demonstrate emission reductions utilizing the accounting methodology developed through the stakeholder process by the Colorado Department of Public Health Environment ("CDPHE") and incorporated by the Colorado Public Utilities Commission ("Commission"). Finally, I discuss areas for improvement in greenhouse gas accounting for the natural gas system and customer emissions.

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

A. Yes, I am sponsoring Attachments LWQ-1 through LQW-5, which were prepared by me or under my direct supervision. The attachments are as follows:

- Attachment LWQ-1: Xcel Energy TCR All Star Status;
- Attachment LWQ-2: CHP Workbook Clean Heat Plus;
- Attachment LWQ-3: CHP Workbook Cost Target;
- Attachment LWQ-4: CHP Workbook Electrification Only; and

- Attachment LWQ-5: CHP Workbook Emissions Target.

Q. WHAT RECOMMENDATIONS ARE YOU MAKING IN YOUR DIRECT TESTIMONY?

A. I recommend that the Commission approve the verification workbooks as submitted for each Cleat Heat portfolio. I further recommend that the verification workbooks be updated to align with Commission Rules, as I describe in more detail below.

II. BACKGROUND ON EMISSIONS ACCOUNTING

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

A. The purpose of this section of my testimony is to provide a brief history of my involvement in the development of Greenhouse Gas ("GHG") accounting in Colorado and explain the Company's commitment to transparency in greenhouse gas accounting for both our gas and electric businesses.

Q. PLEASE PROVIDE BACKGROUND ON YOUR EXPERIENCE WITH GHG EMISSIONS ACCOUNTING.

A. House Bill 19-1261, passed in 2019 by the General Assembly, set the state's economywide GHG reduction targets and thereby heightened the need for transparent, accurate GHG accounting to ensure the achievement of emissions reductions. The Air Pollution Control Division ("Division") within CDPHE is responsible for the state's GHG inventory under Regulation 22 to track emissions annually across each sector and emitting entity. As part of the development of the inventory and reporting requirements, I have participated in the stakeholder processes convened by the Division to develop detailed accounting methodologies for both the Clean Energy Plans on the electric side and Clean Heat plans on the gas side. In 2020, I participated in the development of the Clean Energy Plan Guidance. This Guidance establishes the Colorado GHG protocol by which the Division can evaluate whether electric clean energy resource plans achieve 80 percent emissions reductions from 2005 levels by 2030. The Clean Energy Plan Guidance was passed by the Air Quality Control Commission ("AQCC") prior to the Company submitting its first Clean Energy Plan in 2021 (Proceeding No. 21A-

0141E). I subsequently served as the Company's expert witness on GHG accounting in this proceeding.

In 2021, the General Assembly passed Senate Bill 21-264, creating the pathway for Clean Heat Plans to drive emissions reductions from the delivery and direct use of natural gas. The general structure of Clean Heat Plans is similar to that on the electric side in that the Division was tasked with creating a template that can be used to assess GHG emission reduction achievements in utility plans; however, the GHG accounting itself is much different due to differences in emissions associated with natural gas versus the electric sector (there are also legal differences with Division authorities and safe harbor, but I will not cover those here.) By way of process, the Division convened a stakeholder group to create the Clean Heat Plan Guidance to establish the GHG protocols that can be used to determine if utility clean heat plans are meeting the GHG requirements for the gas business. I participated in this process on behalf of the Company.

Given differences in emissions and measurement methodologies in the gas value chain (described later), the development of the Clean Heat accounting protocol was more difficult and will require iteration over time. I would suggest the guidance is, in fact, the first iteration of the protocol and it will necessarily need to develop further as we gain more experience reducing emissions in this sector, emissions detection improves, and policies evolve.

A few other relevant experiences include my current involvement on the Markets Plus GHG Task Force to determine how GHG accounting can fit into market structures for all states across the West. I also lead Public Service

engagements in the AQCC more generally, with a recent focus on the evolution of Regulation 22 and the development of the State's first Building Performance Standards (Regulation 28), which impacts emissions reductions from large buildings. My team is also responsible for much of the Company's internal and external GHG accounting in coordination with the Environmental Services Department.

Q. PLEASE DESCRIBE THE COMPANY'S APPROACH TO GHG EMISSIONS ACCOUNTING.

A. The Company supports timely, transparent, public reporting of carbon dioxide and other GHG emissions. We have a long history of providing transparent emissions data with a strong focus on our electric emissions along with the methane emissions associated with our natural gas local distribution company ("LDC"). The Company, through its parent Xcel Energy Inc., joined The Climate Registry ("TCR") as a founding member in 2007 to help establish a consistent and transparent standard for calculating, verifying, and reporting GHGs. Every year, an independent third-party verifies our GHG emissions, and we register and publicly disclose these emissions through TCR. After joining, we verified our emissions back to 2005, such that we now have 15 consecutive years of third-party verified data in accordance with TCR. We are the only electric utility with this length of consecutively verified data. In 2019, TCR recognized our reporting with its top (All Star) status for excellence.[1] The All Star rating is the highest honor in TCR's

[1] See Attachment LWQ-1.

recognition program, which evaluates reporting of GHG performance metrics, GHG reduction goal setting, and emissions verification.

Q. WHAT EMISSIONS ARE COVERED IN TCR, THIRD-PARTY VERIFICATION, AND YOUR OWN REPORTING?

A. Our comprehensive reporting covers all aspects of our business. TCR reporting is based on the Electric Power Sector Protocol and the General Protocol, along with recent updates from 2020, which aligns with the World Resources Institute ("WRI") and the International Organization for Standardization ("ISO") 14000 series standards. TCR specifically covers all scopes of the electric sector, going above and beyond the requirements of Environmental Protection Agency ("EPA") reporting to get a full view of the carbon emissions from Company-owned electric generating plants and from electricity that we purchase from others to serve customers, including both our retail and wholesale customers. On the gas side of the business, TCR and our third-party verification covers the methane emissions from our LDC system.

Since announcing our Net-Zero Vision for our gas business, we have expanded our GHG reporting focus to also consider scope 3 emissions, specifically customer carbon emissions and upstream methane emissions from the supply of natural gas. Customer emissions have been reported for several years through EPA Subpart NN reporting. Company witness Dr. Sydnie Lieb covers our accounting for upstream emissions. These two categories are not yet third party verified, but we are considering doing so in the future as methodologies evolve.

For methane on our own system, we have also participated in several initiatives to improve methane emissions reporting, including Our Nation's Energy Future (ONE Future) and the Natural Gas Sustainability Initiative (NGSI); further, we are currently evaluating Project Veritas as a protocol for using direct monitoring to measure, validate, report, and certify methane emissions from our gas operations. We seek to improve our inventory emissions utilizing new monitoring technologies and reduce overall emissions to net-zero over time. Company witness Mr. Gardner brings forth the Company's request to implement Advanced Leak Detection capabilities to gain a better inventory and reduce LDC methane emissions as part of a broader set of Market Transformation Initiatives. This Initiative is a critical path to improving methane inventories on the LDC, which we understand is also important to our stakeholders.

We report all GHG data associated with our business annually in our Sustainability Report. As discussed above, GHG accounting for all emissions associated with direct use of natural gas is more difficult primarily because the emissions sources are small from an individual emissions perspective, but large from a cumulative perspective. Unlike the electric sector where there are large point-sources that have Continuous Emission Monitoring Systems installed and measured on-site, the gas system consists of millions of miles of pipes that may see very small individual emissions along with millions of customers that emit carbon dioxide in small quantities in homes and businesses. Despite these challenges, just as we have been a leader in the most comprehensive reporting

for our electric business, we seek to be at the forefront of robust and transparent accounting for our gas business as well.

Q. HOW WOULD YOU DESCRIBE THE COMPANY'S OVERALL POSITIONING IN THE ELECTRIC AND GAS INDUSTRY, AND ACROSS ALL SECTORS FOR THAT MATTER, AS IT RELATES TO GHG EMISSIONS ACCOUNTING?

A. The Company has been a leader in the field of GHG emissions accounting for years. Our long-term GHG emissions reduction goals along with transparent accounting to support them are among the most comprehensive in the industry, primarily because of the inclusion of Scope 3 emissions. We have also worked closely with the State of Colorado to ensure that all the state's reporting and inventory are adequately accounting for the full set of emissions attributable to the state.

Q. IS THE COMPANY'S GHG ACCOUNTING FOR DIRECT USE NATURAL GAS IN LINE WITH THE STATE'S CLEAN HEAT PLAN?

A. Generally, yes, and I will describe that in more detail below. However, we highlight that the Division's template may need to be revised to account for the full suite of emissions reduction pathways that can be used to reduce emissions associated with the gas system, depending on the approach ultimately approved by the Commission here.

III. STATE GHG EMISSIONS REDUCTION GOALS

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

A. The purpose of this section of my testimony is to describe the Clean Heat emissions reductions in the context of the State's GHG emissions reduction goals.

Q. WHAT ARE THE STATE'S OVERALL GHG EMISSIONS REDUCTION GOALS FOLLOWING THE PASSAGE OF SENATE BILL 23-016?

A. The State of Colorado GHG economywide emissions reduction targets were originally set under House Bill 19-1261. The targets were subsequently revised in the 2023 session under Senate Bill 23-016, including the addition of new interim goals. The new statewide emissions reduction goals are 26 percent by 2025, 50 percent by 2030, 75 percent by 2040, 90 percent by 2045, and 100 percent by 2050 (i.e., net zero).

Q. DO THESE STATEWIDE GHG EMISSIONS REDUCTION GOALS APPLY TO THE CLEAN HEAT PLAN?

A. No, these goals set the overarching direction of statewide GHG emissions reductions but individual sector contributions may differ. Sector specific contributions will differ depending on the ability to achieve cost-effective reductions given the market and technology realities of each sector. In the case of natural gas utilities and customers, the relative contribution was set by the Clean Heat Targets, established by Senate Bill 21-264. This legislation requires that gas utility present different portfolios of solutions, including those that meet emissions reduction targets over a 2015 baseline. The statute also establishes a threshold for use of recovered methane to achieve these goals.

Q. DID SENATE BILL 21-264 SET ANY LONG-TERM TARGETS FOR THE GAS BUSINESS?

A. No, the statute specifically does not set any reduction targets after 2030. Instead, the statute directs the Commission, in consultation with the Division, to determine an emissions reduction target for 2035 no later than December 2024. This timeline is important as it allows the Commission to gather more information on the technology, market, and economic realities of this transition and determine the appropriate long-term targets.

Q. WERE THE CLEAN HEAT TARGETS MODIFIED IN THE 2023 LEGISLATIVE SESSION?

A. No. The Clean Heat Targets remain the same as established in 2021 by the General Assembly.

Q. WHAT ARE THE CONTRIBUTIONS OF THE CLEAN HEAT PLANS TO STATEWIDE GHG EMISSIONS?

A. The statewide GHG emissions reduction goals stretch more broadly than the Company's natural gas system, and the Clean Heat Plans may have limited contribution to achieving the economywide targets. Significant contributions will also be required in other sectors. For context, the state's total GHG emissions in 2005 (the target baseline) were 139.3 million metric tonnes ("MMT"). To achieve the GHG emissions reduction targets will require the reduction of nearly 70 MMT by 2030. By contrast, the total 2015 baseline of the emissions associated with Public Service's Clean Heat Plan are approximately 7.1 MMT, rising to ~8MMT in 2020. If we are successful at achieving a 22 percent reduction, the Clean Heat

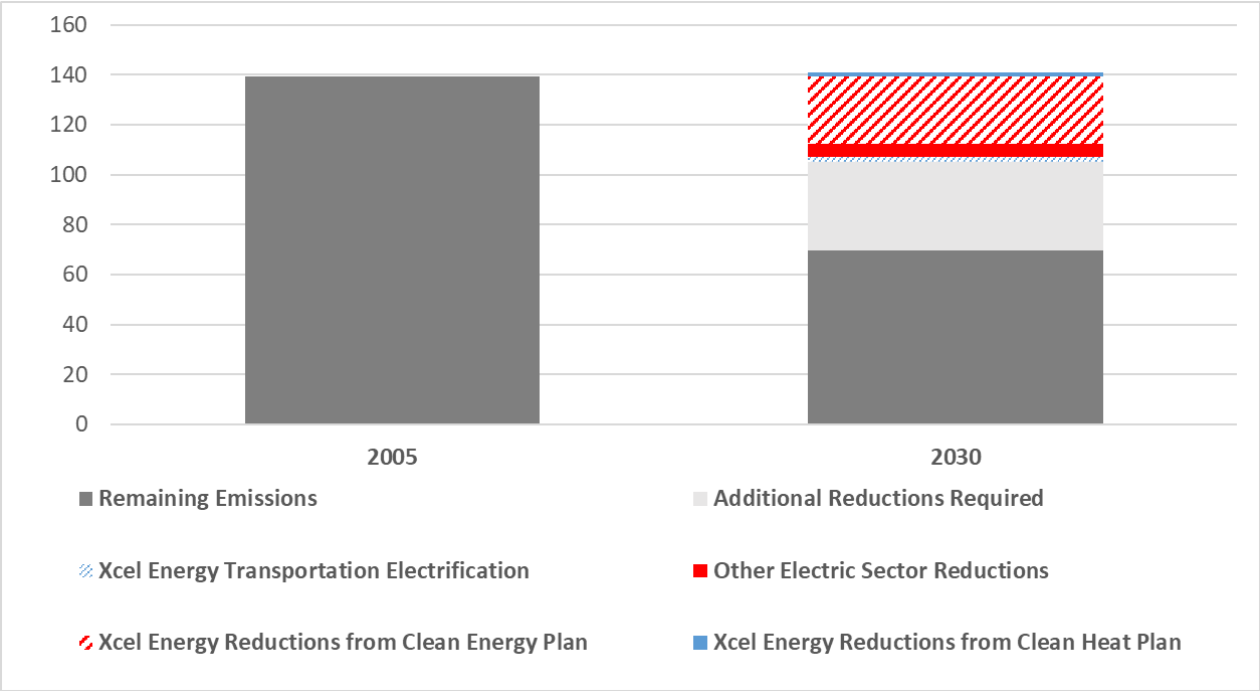
Plan will contribute approximately 1.6 MMT of direct reductions along with avoiding 0.6 MMT of emissions associated with growth for a total of 2.2MMT. In total, this is a contribution of 3 percent of the state's total emissions reduction requirements in 2030, as demonstrated in Table LWQ-D-1 below.

Table LWQ-D-1: Summary of State GHG Emissions Targets and PSCo Clean Heat Baseline and Reductions

Statewide GHG Baseline 2005	139.3 MMT
Statewide GHG Emission Reduction Goal by 2030	69.7 MMT
Current PSCo Clean Heat Emissions (2023 estimated)	7.8 MMT
2015 PSCo Clean Heat Baseline	7.1 MMT
PSCo Clean Heat Reduction Required by 2030	2.2 MMT
2030 PSCo Clean Heat Contribution to Statewide Goals	2.3%

The graph below depicts the relative contribution of the Company's gas system reductions as compared to the electric sector. Additional reductions in other sectors will be needed to achieve the scale of emissions reductions required to hit the state's greenhouse gas reduction goals.

Figure LWQ-D-1: Colorado Economy-wide Emissions and Projected Reduction (MMT CO2e)



Importantly, methane emissions from the LDC system itself is an even smaller portion of these emissions and reductions. Total LDC emissions in 2020 were 191,975 tons according to subpart W, making up just 2.7% of the total Clean Heat baseline and only 8.7% of the total possible emissions reductions. This is equivalent to less the 0.3% of the state's total needed reductions.

Q. WITH THAT BROADER CONTEXT AND RECOGNIZING THE COMPANY HAS EMISSIONS FROM ITS LDC BUSINESS, PLEASE DESCRIBE THE COMPANY'S GHG EMISSIONS REDUCTION GOALS FOR ITS LDC BUSINESS.

A. As part of our vision to become a net-zero energy provider by 2050, we seek to address all the emissions associated with our business and delivery of electricity and natural gas to our customers. As described in Mr. Ihle's Direct Testimony, the

Company seeks to deliver net-zero emissions gas to customers by 2050, along with several interim 2030 goals including: (1) net-zero methane emissions from the LDC system itself; (2) a commitment to source only certified low methane emissions natural gas for both electricity generation and gas distribution; and (3) a combined net 25 percent reduction in all GHG emissions by 2030 (from 2020 levels). In this way, our approach leverages our buying power to significantly reduce methane emissions from our suppliers, continues to improve and mitigate methane emission from our own distribution system and, finally, provides a portfolio of voluntary programs that will enable our customers to manage and reduce their own carbon dioxide emissions. This Net-Zero Vision is paired with our electric sector goals to achieve 80 percent reductions by 2030 and carbon-free by 2050 along with our transportation goals to enable 1 out of 5 vehicles in the areas we serve to be electric by 2030 and providing the infrastructure and energy to run all vehicles in our service area with carbon-free electricity or other clean energy by 2050.

Q. HOW DO THESE COMPARE TO THE REST OF THE INDUSTRY?

A. Our GHG emissions reduction targets was the first energy provider to publicly announce a comprehensive vision to reduce emissions in the three largest emitting sectors of the economy: electricity; natural gas; and transportation. Our Net-Zero Vision for the gas system are among the most aggressive in the natural gas industry, primarily because they cover Scope 3 emissions, including both our customers and upstream supply of natural gas. Including Scope 3 emissions in a gas utility target is ambitious and more difficult because the emissions from our

customers and suppliers are not in our direct control. We believe it is important to take responsibility and agency to enable emissions reductions to ensure the entire natural gas value chain is doing its part to reduce emissions. These goals require us to work closely with our customers – both large and small – along with our suppliers to help them reduce emissions in addition to addressing methane on our own system.

Q. HOW DO THE COMPANY GOALS ALIGN WITH THE CLEAN HEAT TARGETS?

A. Our goals are directly aligned with Clean Heat, with some variations. Our corporate target seeks to achieve 25% reductions by 2030 over a 2020 baseline as opposed to a 22% reduction over a 2015 baseline in Clean Heat. There has been significant growth in the gas system between 2015 and 2020 which we will seek to address in Clean Heat.

One other difference is our Company goals have prioritized the reduction of methane emissions, both in our gas system and upstream supply. With a higher global warming potential, we believe reducing methane within this decade across the value chain is a priority action to reduce the climate change impact of natural gas usage in the short term. In the case of the gas system, the ability to reduce emissions in Clean Heat Plans are restricted due to the requirements to generate recovered methane credits and threshold limit of use of those resources. For the Company's certified low-methane gas goal, we believe it is important, as a major buyer of natural gas, to be involved in driving emissions reductions from the production and delivery of natural gas as well. As described below, we believe this is a way to achieve cost-effective, verifiable methane reductions at scale.

IV. GHG ACCOUNTING PROTOCOLS

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

A. The purpose of this section of my testimony is to explain the purpose and develop of the Division's Clean Heat Guidance and Workbooks along with the details of how these workbooks support transparent accounting of the four Clean Heat portfolios the Company is submitting.

Q. HOW DOES THE COMPANY ACCOUNT FOR GHG EMISSIONS REDUCTIONS ON THE GAS SYSTEM FOR CLEAN HEAT PLANS?

A. GHG accounting for Clean Heat Plans follows the Clean Heat Plan Emissions Calculation Guidance and Clean Heat Plan Calculation Workbooks ("Division Guidance" and "Workbook") published by the Division.[2] This Division Guidance and Workbook provide details on how to account for baseline and forecast emissions, including methane emissions from the LDC system and carbon dioxide emissions from customers, and emissions reductions from the eligible measures covered under SB 21-264. The Guidance and Workbook are also accompanied by the AQCC Recovered Methane Protocol rulemaking, which provides even more detailed accounting and credit market requirements for all recovered methane measures, including LDC methane abatement and coalmine methane.

[2] Clean Heat Plan Emissions Calculation Guidance & Draft Workbook - Google Drive

Q. WHAT IS THE DIVISION GUIDANCE AND WORKBOOK AND HOW WAS IT DEVELOPED?

A. The Division Guidance and Workbook establish the accounting methodologies to assess the emissions reductions in each Clean Heat Portfolio to allow transparent and clear data. The Guidance and Workbook were created through a technical stakeholder process convened by the Division and published on the Division website. As stated in the Guidance:

> The technical working group is composed of participants from the academic community, environmental organizations, local governments and utilities. Working group meetings are open to the public and meeting materials and other documentation are posted on the Division's web site.

The template was created at a certain period of time to meet the Clean Heat deadlines and serves as a framework to assess these initial plans. However, we recognize that the template will likely need revisions over time to address changes in policy, market, and technology. We believe this position is shared by the Division and stakeholders as well. The Guidance also states:

> The Division recognizes that there are multiple federal actions expected to occur shortly after the initial publication of this Guidance and Workbook tool. Additionally, there is significant ongoing work being conducted by academic, environmental, utility and other organizations to improve the accuracy of emission factors used for annual GHG emissions inventory report from natural gas distribution and combustion activities.
>
> Publication of this Guidance and Workbook cannot be delayed until the completion of all these pending activities because the PUC must finalize its updated gas planning rules by December 1, 2022. The Division intends to continue the technical stakeholder engagement in 2023 to assess pertinent developments impacting gas distribution utilities and emissions accounting methodologies and reporting requirements for this sector. The Division anticipates updating the

Workbook and Guidance document when necessitated by these developments and any other future actions.[3]

Q. HOW DOES THE WORKBOOK ACCOUNT FOR EMISSIONS REDUCTIONS BY EACH CLEAN HEAT RESOURCE ENUMERATED IN THE STATUTE?

A. The Division Guidance and Workbook[4] provides a comprehensive description of the accounting used in this Clean Heat Plan. As an overview, the workbook starts with historical emissions data from the 2015 baseline and business as usual forecast from 2022 to 2030 covering both LDC methane and customer carbon dioxide emissions. On a separate tab, the Workbook then shows emissions reduction achievements for "Demand side Clean Heat Resources", "Supply Side Recovered Methane Resources", and "Supply Side Clean Heat Resources." The table shows both the total throughput savings or replacement and the associated emissions reductions for years 2025 and 2030. The final "Plan Summary" tab brings these data together into one place to assess whether the emissions reductions efforts outlined in the portfolio meets the requirements of the clean heat statute, including both the GHG target reductions and recovered methane threshold requirements.

Q. PLEASE DESCRIBE HOW THE WORKBOOK ESTABLISHES THE 2015 BASELINE.

A. Customer carbon dioxide baseline emissions are calculated based upon historical sales data by customer class. Importantly, the Workbook uses non-weather

[3] Clean Heat Emission Calculation Guidance. Air Pollution Control Division, Published October 7, 2022. Clean Heat Plan Emissions Calculation Guidance & Draft Workbook - Google Drive https://drive.google.com/drive/folders/1KCbypmtlxacKEO5YkiJh4k6XE0tFlUzv.
[4] Clean Heat Plan Emissions Calculation Guidance & Draft Workbook - Google Drive

normalized historical actual data for the baseline, per the requirements of the Guidance. This means that it does not account for whether the winter heating season was extremely cold or milder. Emissions are calculated by multiplying total throughput by the EPA Subpart NN combustion factor of natural gas to CO2. LDC methane emissions are based on EPA Subpart W.

Q. PLEASE DESCRIBE HOW THE WORKBOOK ESTABLISHES FORECASTED EMISSIONS?

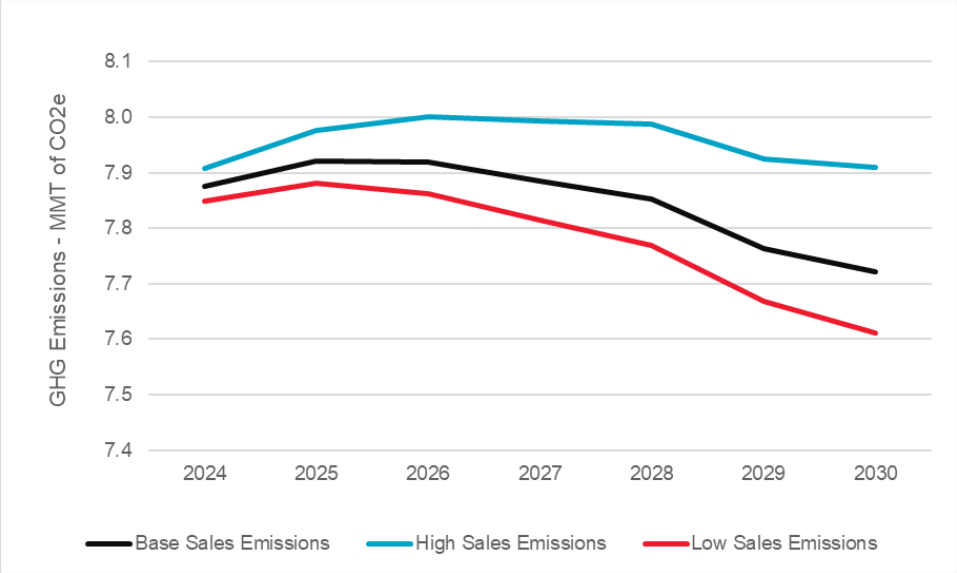
A. First, the workbook establishes a long-term forecast of emissions based upon the Company's long-term gas sales forecast (discussed by Company witness Goodenough) and a projection of Subpart W emissions. By contrast to the baseline, the forecast can only be calculated on a weather-normalized basis. The customer emissions forecasts are based on forecasted retail sales throughput multiplied by the CDPHE verification workbook emissions factor. The forecasts reflect anticipated growth in customers in the near term. To achieve the Clean Heat targets, we will have to both "bend the curve" on growth in the early years to then deliver reductions below the original baseline.

LDC methane emissions are based on EPA's Subpart W reported values – the forecast assumes the total emissions will stay relatively flat, with slight decreases year over year through 2030 due to both replacement projections and assuming all new pipeline miles will be plastic pipe.

The forecast of these emissions effectively provides a counterfactual "business as usual" baseline against which Clean Heat portfolio emission reductions are applied. Forecasted retail sales, representing base sales forecasts

and high and low sensitivity forecasts, and associated GHG emissions are presented in the figure below. These emissions forecasts are developed by taking the forecasts discussed in more detail by Company witness Mr. Goodenough and converting the throughput values to CO2.

Figure LWQ-D-2: Projected Customer and LDC GHG Emissions Based on Initials Sales Forecasting



Q. PLEASE DESCRIBE IN DETAIL HOW THE EMISSION REDUCTION IMPACTS OF CLEAN HEAT RESOURCES ARE APPLIED AGAINST THE BUSINESS-AS-USUAL EMISSIONS FORECAST.

A. From the business-as-usual forecast for 2025 and 2030, the workbook then calculates emissions reductions attributable to each clean heat resource. For any measure that avoids a molecule or dekatherm ("Dth") of natural gas delivered to a customer, such as energy efficiency or electrification, the avoided natural gas is reflected in 2025 and 2030 as a Dth savings and converted to metric tons of carbon dioxide savings through the average EPA combustion factor of natural gas. These

measures are referred to as demand side clean heat resources as they affect customer demand for natural gas. SB 21-264 also allows for a variety of supply side resources, including "recovered methane resources," and others such as hydrogen blending. Recovered methane resources must meet all the requirements of a recovered methane protocol passed by the AQCC; the associated credits are reflected in the Division Guidance and Workbook as a total of metric tons of GHG reduced. Similarly, reductions from hydrogen are reflected as a replacement molecule of gas and shown with the associated emissions factor to calculate the tons reduced, given the reduced emissions profile of hydrogen as compared to traditional natural gas.

Q. IS THE DIVISION GUIDANCE AND WORKBOOK A COMPREHENSIVE WAY TO ENSURE VALID EMISSION REDUCTIONS?

A. Yes. The Division Guidance and Workbook follows the best available emissions accounting in the context of the requirements of SB 21-264. However, as stated above, we believe the Guidance and Workbook will need to evolve over time to better reflect the realities of achieving emissions reductions in the LDC sector. As described below, we understand the Division and other stakeholders likely agree with the need for future work.

Q. ARE THERE ANY OTHER AREAS OF CONCERN IN THE GUIDANCE AND WORKBOOK?

A. While we agree that the Division Guidance and Workbook meet the requirements of SB 21-264 and can be used to assess this first Clean Heat Plan, we see three issues that need to be considered in the Commission evaluation.

Q. WHAT IS THE FIRST ISSUE?

A. While the protocol addresses all the eligible measures included in statute, it does not cover other available emission reduction measures evaluated in our Clean Heat Plus portfolio.

Q. WHAT IS THE SECOND ISSUE?

A. The current calculations of the recovered methane threshold is not consistent with final Commission rules.

Q. WHAT IS THE THIRD ISSUE?

A. With our proposal to implement direct measurement for our LDC system, the emissions accounting for methane on our system will need to be revised. I will address these three in turn below.

Q. COMING BACK TO THE FIRST ISSUE, DOES THE DIVISION GUIDANCE AND WORKBOOK COVER ALL THE EMISSIONS REDUCTION TOOLS ANALYZED BY THE COMPANY FOR POTENTIAL USE IN THE CLEAN PLUS PORTFOLIO?

A. No, the Guidance and Workbook includes the measures specifically listed in Senate Bill 21-264. However, as explained in more detail by Company witness Mr. Ihle, we believe the Commission has the ability to approve and consider additional emissions reduction measures in order to meet their obligation to balance both emissions reductions with cost impacts to customers. In our Clean Heat Plus portfolio, we also consider high quality offsets and certified low-methane emissions natural gas (“CNG”) as they are low-cost measures to achieve emissions reductions for our customers. There are verifiable methodologies to capture these emissions reductions available that could easily be added to the State’s accounting

process. As explained by Company witness Mr. Weinberg, offsets are a long-used and cost-effective measure with verification methodologies readily available. In fact, the Division chose four carbon offset protocols for use in the recovered methane protocol – we are proposing to use similar, if not the same, protocols for other types of offset projects. Similarly, Mr. Weinberg addresses our proposed project to work with the Southern Ute Tribe on a coal bed methane project that also can produce verifiable emissions reductions. Moreover, as explained by Company witness Dr. Lieb, the purchase of CNG environmental attributes also produces verifiable emissions reductions from the upstream that can be quantified with sound GHG accounting protocols. We anticipate these methodologies will also improve over time.

Q. IS THE FACT THAT THERE IS NOT AN AQCC PROTOCOL IN PLACE A REASON TO NOT PURSUE THE USE OF THESE TOOLS?

A. No. While I support continued improvements in the measurement and verification of these emissions reductions, the suggestion that there is no way to calculate or verify these emissions reductions is false. Further, of utmost importance is making real and quick progress towards achieving real emissions reductions, particularly in a sector, like the LDC sector, where emissions reductions are challenging. In the context of GHG accounting, we cannot let the perfect or the lines of each sector foreclose real emissions reduction opportunities.

Q. ARE THERE POTENTIAL LONG-TERM BENEFITS WITH MOVING FORWARD NON-ENUMERATED EMISSIONS REDUCTION TOOLS TODAY AS OPPOSED TO WAITING FOR ANY PROTOCOL TO DEVELOP?

A. Yes, particularly for CNG. One question often posed about CNG is whether the state standards are driving the reductions more so than market purchasers, and if so, whether the purchaser should receive any credit. We believe the answer is both are true. We wholeheartedly agree that CNG needs to go above and beyond applicable state standards; accordingly, that is a prerequisite we already have in place. In addition to going beyond State requirements, we believe the emissions reductions will need to be documented with a certificate with a quantifiable emissions rate and the owner of that certificate would claim the emissions reduction for state regulatory accounting purposes and accounting for the full methane emission intensity. This type of approach can avoid double-counting concerns with emissions reductions across sectors. Further, it acknowledges the fact that large purchasers, as a major part of the market, has an important role in driving emissions reductions. If we do not ask for and push for best practices and emissions reductions on behalf of our customers, then they may not otherwise occur. Further, such an approach has implications broader than the State of Colorado impacting emissions reductions in gas production nationally, including states without methane regulations. Lastly, voluntary emissions reporting also promotes the accounting of upstream purchases – also known as Scope 3 – to take ownership of the full footprint of emissions. Scope 3 reporting seeks to report and track the emissions associated with upstream purchasers such that the

purchaser can understand the full scope of emissions and take any action to help reduce those, regardless of who ultimately takes credit from a regulatory perspective. Following this theory, we set our own goal to include upstream emissions in order to transform the market and achieve methane reductions early. To the extent our call to action as a purchaser becomes the market standard, we have achieved the goal of emissions reductions in the upstream sector and used our position in the market to drive those reductions

Q. RETURNING TO THE SECOND ISSUE, DESCRIBE THE DESCREPANCY BETWEEN THE DIVISION GUIDANCE AND WORKBOOK AND COMMISSION RULES WITH REGARD TO RECOVERED METHANE.

A. The discrepancy with recovered methane is the interpretation of the allowable threshold for recovered methane to achieve the Clean Heat Targets. SB 21-264 provides the following language limiting the use of recovered methane in Clean Heat Plans for the 2025 and 2030 Clean Heat Targets, respectively:

> A gas distribution utility shall demonstrate compliance with subsection (3)(b)(I) of this section by filing and obtaining commission approval of clean heat plans that meet clean heat targets calculated as follows: Consistent with subsection (3)(c) of this section and as compared to a 2015 baseline, a four percent reduction in greenhouse gas emissions in 2025, *of which not more than one percent can be from recovered methane*; and a twenty-two percent reduction in greenhouse gas emissions in 2030, *of which not more than five percent can be from recovered methane*.[5]

Due to the timing of the Division Guidance and Workbook being released two months prior to the final Commission Rules, the Division Guidance and

[5] § 40-3.2-108(3)(b)(I)-(II), C.R.S. (emphasis added).

Workbook does not align with the Commission's Rules with respect to the allowable use of recovered methane. We believe the Division Guidance and Workbook needs to be updated to align with Commission Rules.

The Division Guidance and Workbook, released in October 2022, calculates the allowable recovered methane emission reductions for 2025 as one percent of the 2015 baseline emissions, which does not account for growth in the LDC business between 2015 and the 2025 target year, nor does it relate the amount of recovered methane to the amount of required emissions reductions, as set forth in the statute. We believe this is an overly restrictive interpretation.

In December 2022, the Commission issued its final rules for Clean Heat Plans, which provide that recovered methane can be used for one-fourth of the emissions reductions required to meet the 2025 Clean Heat Target.[6] The Commission Rules take the same approach for the 2030 Clean Heat Target.[7] The Commission further provides that "a jurisdictional gas utility's clean heat plan may exceed the recovered methane caps set forth above … if the Commission finds that the utility otherwise could not cost-effectively meet the clean heat target."[8]

[6] Rule 4728(d)(I)(A) ("(I) The following clean heat targets apply for a gas distribution utility: (A) four percent reduction in greenhouse gas emissions in calendar year 2025 as compared to a 2015 baseline, of which not more than one percent (*one-fourth of the emission reductions required to meet the 2025 target*) can be from recovered methane") (emphasis added).
[7] Rule 4728(d)(I)(B) ("(I) The following clean heat targets apply for a gas distribution utility: … B) 22 percent reduction in greenhouse gas emissions in calendar year 2030 as compared to a 2015 baseline, of which not more than five percent (*five-twenty seconds of the emission reductions required to meet the 2030 target*) can be from recovered methane, unless subparagraph (C) below applies …")
[8] Rule 4728(d)(I)(C).

Q. RECOGNIZING YOU ARE NOT AN ATTORNEY, WHY DOES THIE COMMISSION INTERPRETATION MAKE SENSE FROM AN EMISSIONS ACCOUNTING PERSPECTIVE?

A. The Commission interpretation considers system growth, which results in a greater relative emission reduction than if system emissions would have remained constant under the 2015 baseline. The Commission's interpretation of statute in its Rules allows for a greater threshold of emissions reductions from recovered methane. Following the Division's Guidance and Workbook would allow for just over 70,000 MT CO2eof recovered methane in 2025, while Commission rules allow for a higher amount, i.e., 315,000 MT CO2e of recovered methane.

Resolution of this inconsistency is imperative because it determines how much recovered methane is allowed in any given Clean Heat Plan. We believe the Commission, as the economic regulator with primary authority over Clean Heat Plans and the entity charged with interpreting the statutory provisions governing Clean Heat Plans, has ultimate authority to determine the limit and any exceedance of the limit; accordingly, the template should be updated to reflect the Commission approach.

Q. WHAT INTERPRETATION OF THE RECOVERED METHANE THRESHOLD IS INCLUDED IN THE WORKBOOKS BEING SUBMITTED?

A. We are submitting workbooks following the Commission Rules.

Q. CIRCLING BACK TO METHANE ON THE LDC SYSTEM, HOW DOES THE DIVISION GUIDANCE AND WORKBOOK ACCOUNT FOR THESE EMISSIONS

AND WOULD THEY NEED TO BE UPDATED TO ACCOUNT FOR ANY PROPOSAL TO IMPLEMENT DIRECT MONITORING?

A. The Division Guidance and Workbook currently uses EPA subpart W as the emissions accounting basis for methane on the LDC system. The EPA accounting is currently the best available data and makes sense for this initial Clean Heat Plan. However, EPA accounting is based on emissions factors rather than direct measurement. Specifically, it is the miles of pipe multiplied by an emissions factor based on the pipe materials. Under Subpart W, the way to achieve emissions reductions is through pipeline replacements. The Company has already replaced its higher emitting cast iron pipeline. Our system is primarily made up of lower emitting plastic and protected steel pipe, with 98% of our over 25,000 pipeline miles constructed of either plastic or protected steel as of 2022.[9]

We can achieve a more robust inventory and drive more cost-effective reductions through our proposed direct monitoring program (as addressed in the Direct Testimony of Company witness Mr. Gardner) and implementing a robust GHG accounting protocol, e.g., the Veritas Initiative.[10] Based upon ongoing industry dialogues, we understand this more expansive greenhouse gas accounting is desired, even if it was not possible in this round of Clean Heat Plan-

[9] Numbers taken from 2022 annual filings to the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA). Report information is publicly available in spreadsheet format on PHMSA website: Gas Distribution, Gas Gathering, Gas Transmission, Hazardous Liquids, Liquefied Natural Gas (LNG), and Underground Natural Gas Storage (UNGS) Annual Report Data | PHMSA (dot.gov).

[10] GTI Energy's Veritas initiative is a set of standardized, science-based, technology-neutral, and measurement-informed protocols. These protocols assemble methane emissions inventories that are verified by direct field measurements. *See* GTI Energy Launches Open-Source Protocols to Accelerate Methane Emissions Reductions (Feb. 14, 2023), *available at* https://www.prnewswire.com/news-releases/gti-energy-launches-veritas-open-source-protocols-to-accelerate-methane-emissions-reductions-301745351.html.

related Guidance development. We would welcome the chance to continue the stakeholder process to develop Colorado accounting protocols for methane on the LDC system, and we believe it is necessary given the issue I raise here, and issues raised by other parties towards the end of the rulemaking in Proceeding No. 21R-0449G.

Q. CAN THE DIVISION GUIDANCE AND WORKBOOK AND RELEVANT PROTOCOLS BE CHANGED OVER TIME?

A. Yes, we view these protocols as essential to moving forward with this first Clean Heat Plan, but as we gain more market knowledge and technology develops, the protocols will need to evolve over time. This is not a criticism of the Division Guidance and Workbook; it is, however, a recognition of the fact that this is an ongoing dialogue and emissions reduction approaches will change as technologies and measurement capabilities mature. Indeed, as noted above, the Division plans to continue the stakeholder process to ensure updates are made as needed. The Division Guidance and Workbook further provides that "[t]he Division intends to continue the technical stakeholder engagement in 2023 to assess pertinent developments impacting gas distribution utilities and emissions accounting methodologies and reporting requirements in this sector."[11] The Division cites LDC methane, in particular, as an area of likely advancement in coming years warranting further consideration: "[A]dvanced leak detection programs and improvements to system leakage estimations are topics that the

[11] Clean Heat Emission Calculation Guidance. Air Pollution Control Division, Published October 7, 2022. Clean Heat Plan Emissions Calculation Guidance & Draft Workbook - Google Drive.

Division continues to be interested in and intends to continue developing through ongoing technical stakeholder workgroup discussions."[12] We look forward to continuing the workgroup discussions, which can be informed by Clean Heat Plan development and activities here at the Commission.

[12] *Id.*

V. VERIFICATION WORKBOOKS FOR CLEAN HEAT PORTFOLIOS

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

A. In this section of my testimony, I present the verification workbooks that have been prepared to evaluate the emissions reductions achieved in each of the four core Clean Heat portfolios.

Q. HOW MANY VERIFICATION WORKBOOKS IS THE COMPANY PRESENTING?

A. We are presenting four verification workbooks, one for each of the core Clean Heat portfolios. This includes Cost Target, Emissions Target, Electrification Only, and Clean Heat Plus. We provide an individual workbook for each portfolio for purposes of consistency and transparency.

Q. PLEASE DESCRIBE THE PREPARATION OF EACH WORKBOOK.

A. The workbooks were prepared in line with the requirements of the Division Guidance and requirements. The baseline and business as usual forecasts were prepared first with Company data and consistent with the forecasts prepared by Company Witness John Goodenough, per above. The baseline and forecasts are consistent across all 4 portfolios. We worked with our modeling consultant, E3, to prepare the inputs for the emissions reductions measures for both demand and supply side resources, which differ across each of the four portfolios. E3 also helped prepare the data summary tab for overall verification of emissions reductions. These workbooks were reviewed by the Company for accuracy and consistency.

Q. DOES EACH WORKBOOK SHOW THE PROJECTED EMISSIONS REDUCTION IN 2025 AND 2030 FOR EACH CLEAN HEAT PORTFOLIO?

A. Yes, each workbook shows both the business-as-usual forecast and the achievement of emissions reductions that meet the 2030 target. All of the portfolios hit the 2030 target with the exception of the Cost Target Portfolio.

Q. DO THE WORKBOOKS INCORPORATE THE COSTS OF THE PORTFOLIOS?

A. No, the workbooks do not provide costs, consistent with the direction of the Clean Heat Statute. The purpose of the workbooks is only to assess emissions reductions whereas the costs are presented separately by the Company for Commission evaluation.

Q. THE CLEAN HEAT PLUS PORTFOLIO USES REDUCTION MEASURES THAT YOU MENTIONED WERE NOT PART OF THE DIVISION WORKBOOK. HOW DID YOU HANDLE THESE MEASURES IN THE WORKBOOKS BEING SUBMITTED?

A. In the interest of honoring the workbooks while also providing full transparency, we did not include reductions from CNG or offsets in the workbook for Clean Heat Plus. To provide a more comprehensive view of the emissions reductions from Clean Heat Plus, however, we created additional tabs in the Clean Heat Plus workbook to show the portfolio with and without these measures included. In the Clean Heat Plus workbook, you will see the normal “Plan Summary” and “Emissions reductions” according to the original workbook – these two tabs show the emissions reductions with Clean Heat Resources only. We also added the tabs “Plan Summary Clean Heat+” and “Emissions Reductions Clean Heat+” to show

the emissions reductions from the full set of emissions reductions tools used in Clean Heat Plus in their own rows or columns. In the reductions tab, we break out the emissions reductions achieved from CNG and offsets to provide the relative contribution of each.

Q. DID YOU MAKE ANY OTHER CHANGES TO THE WORKBOOKS?

A. Per the discussion above, we did update the recovered methane threshold calculations in cells D17 and E17 in the Plan Summary tab to match the Commission Rules. This change is indicated in the notes. None of the portfolios exceed the recovered methane limit pursuant to Commission Rules interpretation of the Clean Heat Statute. We also made a few additional minor edits and additions for purposes of transparency, which are also noted in Column F on the 'Plan Summary" tab.

Q. AS A RELATED EXERCISE TO THE WORKBOOK AND TO ASSIST IN THE COMMISSION'S EVALUATION OF THE CLEAN HEAT PORTFOLIOS PRESENTED BY THE COMPANY, HAVE YOU CALCULATED THE VALUE OF AVOIDED GREENHOUSE GAS EMISSIONS USING THE SOCIAL COST OF CARBON AND THE SOCIAL COST OF METHANE?

A. Yes. We included a calculation of the benefits of the social cost of carbon and methane from the decreased emissions associated with each plan. This calculation is not part of the verification workbook itself, but we included the data in the "Clean Heat Portfolio Summary" workbooks. The benefits are calculated using the modeled emissions abatement values in CO2e and the interim estimate of the social cost of CO2 using a 2.5% discount rate from the Federal Interagency

Working Group on Social Cost of Greenhouse Gases as of February 2021. We used the social cost of carbon because our avoided emissions are calculated in carbon dioxide equivalent including both carbon and methane emissions – this calculation inherently incorporates the social cost of methane.

Table LWQ-D-2: Estimated Social Cost of Carbon Benefits ($M)

	2024	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Clean Heat Plus	$21.8	$49.4	$85.0	$117.9	$148.7	$180.1	$213.9
Electrification Only	$12.3	$34.0	$64.9	$100.1	$136.8	$175.0	$213.9
Emission Target	$15.9	$45.2	$68.7	$96.0	$130.1	$169.1	$213.9
Cost Target	$7.2	$14.6	$20.3	$27.5	$34.6	$39.8	$46.6

VI. CONCLUSION

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.

A. For purposes of this first clean heat filing, I recommend the Commission approve the verification workbooks for these four portfolios, including the evaluation of the Clean Heat Plus portfolio and the updated interpretation of the recovered methane threshold. Moving forward, we recommend the Commission work with the Division to update the template for the next Clean Heat Plan to account for the evolution of accounting, as outlined in this testimony.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Statement of Qualifications

Lauren W. Quillian

Lauren Quillian is the Director of Energy and Environmental Policy for Xcel Energy. The Energy and Environmental Policy team is responsible for leading Xcel Energy's climate policy, environmental policy, and environmental communications across eight states. Ms. Quillian has worked in environmental or energy policy for over 10 years and worked previously in the Risk Management Department conducting market pricing analytics. Ms Quillian has been directly involved in the development of Colorado climate policy, including the development of the Clean Heat Standard and Clean Heat Guidance, and leads the company participation at the Air Quality Control Commission proceedings, including direct involvement in regulation 22. Ms. Quillian has also helped the company develop the corporate Net Zero Vision and the strategy to address emissions from the natural gas system, customers, and suppliers along with the Carbon Free Vision for our electric business. She is a principal author of several significant corporate reports including Building a Carbon Free Future and Transitioning Natural Gas for a Low Carbon Future. She has represented the Company in many forums, including the Division stakeholder processes for the Clean Energy Plan and Clean Heat guidance and protocol development.

Prior to working at Xcel Energy, Ms. Quillian worked with the American Lung Association to advance electric vehicle policy in Colorado in collaboration with the Department of Energy. Prior to working in the energy industry, Ms. Quillian worked for four years in international development and is fluent in Spanish.

Ms. Quillian has a Master of Public Administration from Columbia University, and a Bachelor of Arts Degree in Foreign Affairs and Spanish from the University of Virginia.