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 JACK W. IHLE

ON

BEHALF OF

PUBLIC SERVICE COMPANY OF COLORADO

August 1, 2023

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CHP – Executive Summary

Colorado has set out a vision for a clean energy future that not only transitions how electric and home heating needs are fulfilled but also substantially transforms our energy delivery system. Such a transformation will entail action by utilities and customers alike through personal choices and financial investments. To make progress towards that vision, while balancing customer expectations for reliability and affordability, this inaugural Clean Heat Plan ("CHP") brings forward a comprehensive package of plans and strategies to reduce carbon and methane emissions from Public Service Company of Colorado's ("PSCo" or the "Company") natural gas local distribution company ("LDC") business. This first-of-its-kind filing begins formal discussion of two issues: (1) what is the best approach for PSCo to reduce LDC emissions in the near-term (2024-2028); and (2) how to achieve a long-term clean energy future that meets our customers' needs while moving toward a net-zero 2050 future. In this proceeding, the Commission needs to address only the first issue. Indeed, this filing is a first step in a longer-term conversation with the Commission, customers, and other stakeholders on how best to achieve the long-term vision for Colorado affordably and reliably.

PSCo is striving to operate the cleanest energy system possible, while continuing to serve our Colorado customers with reliable and affordable energy to power their lives. To support this effort, PSCo has conducted extensive analyses to identify the most effective path to meet the CHP targets. We have learned there is no easy path to achieve these goals. This filing includes robust analyses of a variety of different approaches for reducing emissions while balancing affordability and reliability. These approaches, or pathways, are reflected in Table JWI-ES-1 below and include: (1) a pathway to achieve the emissions targets set by the General Assembly using only Clean Heat Resources; (2) a cost-centered approach that manages to the statutory cost target but as a result is not able to achieve the emission targets; (3) a pathway that relies heavily on electrification; and (4) an approach that we call "Clean Heat Plus" that uses Clean Heat Resources and other available emissions reduction measures to make progress towards the Clean Heat Targets affordably.

Table JWI-ES-1

Near Term Pathway	Portfolio Elements	2028 Reductions (Million Metric Tons)[1]	Average Annual Program Cost ($M, 2024-2028)[2]
Emissions Target	EE, BE, RNG, H2	1.4 MMT	$227
Cost Target	EE, BE, RNG, H2	0.6 MMT	$34
Electrification Only	EE, BE	1.5 MMT	$472
Clean Heat Plus	EE, BE, RNG, H2, CNG, Multisector Reduction	1.6 MMT	$163

In seeking to reduce emissions at the lowest possible cost, our analyses focus not only on the program cost incurred by the Company, but also on the expected costs and investments that customers would need to make in order to achieve the goal. It is important to note that the costs provided in Table JWI-ES-1 reflect only the program costs that will be incurred by the Company for the LDC, such as rebate and clean fuel purchase costs. While all pathways will require customers to incur other costs, such as the personal cost to replace a home heating system, over the long term (i.e., to 2050), these costs vary significantly depending on the pathway chosen.

Because we recognize that affordability for all customers must be a central part of the discussion, the Company is presenting the Clean Heat Plus approach. This approach uses both Clean Heat Resources and a range of other available approaches to reducing emissions—to make significant progress towards the Clean Heat Targets while balancing affordability.

To achieve our collective goals, we need to use every tool we have. That is why the Clean Heat Plus approach employs a broad range of emissions reduction tools, including energy efficiency, electrification, potential hydrogen projects, renewable natural gas, and upstream emissions reductions to achieve greater emission reductions across multiple sectors at a lower cost. By doing so, this approach meets the 2030 goal, manages costs, supports continued development of next-generation clean energy technologies to gauge their success, and creates a solid near-term foundation as we collectively evaluate the best pathways toward a net-zero system by 2050. The Company brings Clean Heat Plus forward as its preferred option based upon extensive modeling and analysis.

[1] 2028 emissions reductions differ slightly between Emissions Target, Electrification, and Clean Heat Plus due to their respective modeling trajectories to the 2030 statutory target level reduction of approximately 2 MMT.

[2] For comparison purposes here, Average Annual Program Cost does not include some additional costs for Market Transformation (i.e., demonstration projects) that we address in our CHP to stimulate technology development. The Market Transformation portfolio and costs are described in Company witness Mr. Jack Ihle's Direct Testimony and the CHP Plan document.

But that is not to say we have all the answers. Instead, the Clean Heat Plus proposal is designed to begin a conversation about the future of the Colorado energy landscape that is grounded in both data and transparency and is agnostic when it comes to technology and fuel-type.

While the Clean Heat Plus portfolio is our preferred option we are also presenting several alternative approaches for consideration and comparison, as shown in Table JWI-ES-1 above. Each approach has strengths and limitations. Each is designed to generate new ideas about the future of the LDC and to balance priorities in different ways.

- The "Emissions Target" approach achieves the emission reduction targets of the statute using only the resources identified in the statute: efficiency, electrification, renewable natural gas, and hydrogen.

- In accordance with the statute, the "Cost Target" approach stays within the 2.5% cost target set by the General Assembly while achieving much lower levels of emission reductions than all other approaches.

- Finally, an "Electrification Only" approach relies exclusively on efficiency and electrification, consistent with the "all electrification" approach that facilitates comparison and evaluation against other approaches that rely on a broader suite of emissions reduction measures.

Across pathways, the role of electrification will be a central consideration in this proceeding, and has been a focus of the analysis. The Electrification Only approach achieves the fastest transition away from existing gas infrastructure. In doing so, it also incurs the greatest programmatic costs. Moreover, under electrification-focused strategies, customers would incur personal costs to electrify their gas appliances and homes. These costs can be in excess of $20,000 per home before incentives for a residential customer retrofitting an existing home to all-electric heating. Depending on the scale of the electrification initiatives, total customer personal costs could be additional billions of dollars, even after rebates.[3] High electrification scenarios also drive incremental electric system investments to ensure that all customers have the power they need. These additional costs in the Electrification Only approach could be as much as $20 billion by 2050. At the same time, significant electrification could reduce investment in LDC infrastructure as that system is phased down over time. Through 2050, these avoided capital savings could be as much as $3.5 billion.[4] As we move forward and

[3] Personal costs are an important part of evaluating the approaches in Clean Heat Plans. These costs are highly customer-specific, and must consider the full cost of electrification, any rebates or other incentives, and potentially consideration of costs that would have been incurred to replace gas equipment, irrespective of rebates or other incentives.

[4] The cumulative capital investments in electric and gas infrastructure out to 2050 represent the difference between a diverse Clean Heat Plus approach carried through to 2050, and an approach that relies on electrification as the predominant emissions reduction measure.

consider pathways for the 2024-2028 period and an approach to the longer term out to 2050, we believe this full cost picture should be part of the discussion.

We approach this effort with humility and in the spirit of driving dialogue, and electrification plays a major role in all portfolios. The role of electrification, considering all costs and technological viability, will remain a key element of this and future Clean Heat Plans. And we recognize that electrification may play an ever-increasing role into the future. Here, Clean Heat Plus is the Company's preferred option because we believe it strikes the optimal balance of reducing emissions while ensuring customers have clean energy choices that meet their needs. Millions of our customers today rely on natural gas for heating their homes and businesses because it is a highly flexible and efficient fuel for millions of furnaces, boilers, water heaters, stoves, and other appliances and can provide heat even on the coldest days of the year. The Clean Heat Plus plan recognizes that our success in achieving our emissions goals depends on providing effective alternatives to customers and it includes a broad range of options that will expand over time.

The Clean Heat Plus plan also follows the successful path we took on the electric side of our business, using proven tools to accelerate emission reductions today, while making strategic investments in new energy innovation so we can take advantage of the most scalable and cost-effective options as they mature. The outcome of that strategy is the same one we aim to achieve here: an affordable clean energy future.

Looking out several decades, Clean Heat Plus is a steppingstone to any 2050 future—it reduces emissions, accelerates development of high potential clean energy technologies that can be scaled over time in future plans, and positions PSCo and the State of Colorado as a national leader in the transition to a greener future. That could be a future where gas and electric infrastructure delivers a variety of clean fuels in concert with electrification; or it could be a future where Colorado invests heavily in achieving an electric future. Regardless of the end state, Clean Heat Plus provides the necessary flexibility and a practical approach to enable multiple paths to a net-zero 2050 future.

With that, we present our inaugural Clean Heat Plan to the Commission, our customers, our communities, and Colorado. Nobody said creating a net-zero carbon gas LDC would be easy, and we do not think it will be. But we have seen the fruits of sustained leadership and collaborative effort in the power sector: PSCo's electric system emissions are half of what they were in 2005. We take up this new challenge with a spirit of determination and collaboration, recognizing that we do not know what we do not know. And we look forward to commencing this effort and journey—together.

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DIRECT TESTIMONY AND ATTACHMENTS OF JACK W. IHLE

I. INTRODUCTION, QUALIFICATIONS, PURPOSE OF TESTIMONY, AND RECOMMENDATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Jack W. Ihle. 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 Regional Vice President of Regulatory 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 overseeing the Company's regulatory filings and strategy as they pertain to resource planning, transmission planning, distribution planning, renewable energy policy, retail product policy, transportation electrification, and other policy matters. A description of my qualifications, duties and responsibilities is set forth in my Statement of Qualifications at the conclusion of my testimony.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my Direct Testimony is to provide an overview of the policy and regulatory aspects of this Clean Heat Plan filing, describe Clean Heat Plan Portfolios that we have analyzed in conjunction with E3, introduce our preferred portfolio called Clean Heat Plus, discuss the implementation of Clean Heat Plus, introduce an innovation portfolio called Market Transformation Initiatives, and propose a cost recovery approach. I also discuss Income-Qualified Customer and Disproportionately Impacted Community opportunities, as well as labor standards and just transition. Finally, this testimony provides an initial perspective on longer-term views of the gas LDC system that inform the near-term decisions the Commission will make in this Clean Heat Plan.

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

A. Yes, I am sponsoring Attachments JWI-1 through JWI-3, which were prepared by me or under my direct supervision. The attachments are as follows:

- Attachment JWI-1: 2024-2028 Clean Heat Plan;
- Attachment JWI-2: Market Transformation Portfolio; and
- Attachment JWI-3: Compiled MOUs and Letters of Support.

Q. PLEASE INTRODUCE THE OTHER COMPANY WITNESSES PROVIDING TESTIMONY AS PART OF THE COMPANY'S DIRECT CASE.

Witness	Summary of Testimony
Jack W. Ihle **Regional Vice President, Regulatory Policy**	Mr. Ihle presents the overview of the 2024-28 Clean Heat Plan, specifically discussing the policy and regulatory aspects of this filing. He also presents the various portfolios brought forward by the Company in this filing and discusses the Company's preferred option, the Clean Heat Plus portfolio.
Dan Aas **Director at Energy and Environmental Economics, Inc.**	Mr. Aas is employed by Energy and Environmental Economics, Inc., or E3. E3 performed the modeling used in the development of the portfolios presented in this filing. Mr. Aas describes the modeling analysis of the presented portfolios.
John Goodenough **Director of Sales, Energy**	Mr. Goodenough presents the Company's methodology for developing our initial forecasts, including a reference (base) forecast along with high and low variations.
Lauren W. Quillian **Director, Energy and Environmental Policy**	Ms. Quillian provides context for the greenhouse gas emissions reductions achieved through the presented portfolios. She details the accounting methodology developed through stakeholder processes to calculate emissions reductions, and discusses areas of improvement in greenhouse gas accounting for natural gas system.
Nick C. Mark **Manager, Demand Side Management Strategy and Policy**	Mr. Mark presents what the company is currently doing for gas demand-side management ("DSM") and beneficial electrification ("BE"), along with discussing the role DSM and BE will play in the portfolios presented in this filing. Mr. Mark explores the challenges of the scale of DSM and BE needed.

Sydnie M. Lieb **Manager, Energy and Environmental Policy**	Dr. Lieb explains the emission reduction potential enabled by Certified Natural Gas ("CNG") and why the Company encourages the Commission to consider approving its use. Dr. Lieb provides context on the CNG resource and corresponding emissions reduction capacity.
Edward P. Weinberg **Senior Consultant, Strategic Asset Planning**	Mr. Weinberg describes the market for renewable natural gas ("RNG") and other projects that fall under the "recovered methane" category of the Clean Heat statute. Mr. Weinberg compares Colorado's RNG market to more developed markets and highlights some challenges faced in other markets. He also presents the Company's proposed coalbed methane recovery project and Renewable*Connect Natural Gas product.
Michael C. Jensen **Director, Clean Fuels PMO**	Mr. Jensen discusses the hydrogen market, including its current state, projected trajectory of the market, and the potential use of hydrogen in the Company's efforts to meet our 2050 clean energy goals. Mr. Jensen discusses several Company hydrogen initiatives in development.
Ray Gardner **Area Vice President, Gas Engineering**	Mr. Gardner discusses two of the Company's proposed market transformation initiatives: introduction of advanced mobile leak detection technology and a hydrogen blending demonstration project. Mr. Gardner also addresses the operational issues associated with the incorporation of clean fuels in the natural gas system, including the technical integration of hydrogen into the LDC system.

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

A. I recommend that the Colorado Public Utilities Commission ("Commission"):

- Approve the Company's 2024-2028 Clean Heat Plan, which is provided as Attachment JWI-1 to my Direct Testimony;
- Approve the selection of Clean Heat Plus as the preferred portfolio for the Clean Heat Plan;
- Approve the Company's proposed Market Transformation Portfolio, including the Market Transformation Initiatives and the Innovation Fund;
- Approve the Company's proposed budgets within the Clean Heat Plus portfolio and the Market Transformation Portfolio, as supported by the testimony of the Company's witnesses;
- Approve the Plan, Do, Check, Act framework, including the 60/90-Day Notice process and the budget flexibility mechanisms;
- Approve the Company's proposed cost recovery mechanisms, including the Clean Heat Support Gas Adjustment and the Clean Heat Support Electric Adjustment;
- Open an M Docket within 60 days of a final order in this Proceeding to explore open issues such as seams, cost-sharing between electric and gas customers, the treatment of transportation customers, and other issues that require Commission and stakeholder input prior to the filing of the Company's next Clean Heat Plan;
- Approve the Company's proposal to file its next Clean Heat Plan no later than August 1, 2027;
- Approve the Company's proposal to track and defer costs incurred in association with preparing and litigating this proceeding into a non-interest-bearing regulatory asset to be reviewed for recovery purposes in a future rate proceeding; and
- Grant any waivers or variances the Commission deems necessary for approval and implementation of the Clean Heat Plan.

II. POLICY LANDSCAPE

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

A. This section of my testimony discusses the policy landscape in Colorado and at the federal level regarding the reduction of greenhouse gas ("GHG") emissions from gas local distribution company ("LDC") systems.

Q. PLEASE DESCRIBE THE POLICY LANDSCAPE FOR GAS LDC GHG EMISSION REDUCTIONS AT A HIGH LEVEL.

A. Unlike the electric power sector, policy relating to gas LDC greenhouse gas emissions planning is in its infancy at both the state and federal levels. Here in Colorado, the movement toward decarbonizing power generation began nearly 20 years ago with the passage of the state's renewable portfolio standard, Amendment 37. In contrast, the General Assembly passed economy-wide emissions reduction goals for the first time in 2019 and passed the first gas LDC-specific targets and planning requirements in 2021. Colorado is leading the nation in advancing an innovative sector-specific emissions reduction framework. At the federal level, Congress has provided financial support for decarbonization in the form of support for hydrogen hubs and tax incentives for installation of heat pumps but has left planning and specific goals to the states.

The state of Colorado is driving change for gas LDC GHG emission reductions. Senate Bill 21-264 is among the first state laws in the U.S. that require comprehensive planning of GHG emission reduction by gas LDCs. The Commission has followed suit with comprehensive infrastructure and GHG emission reduction rules. In step and in partnership with its states, Xcel Energy

too has sought to lead, first developing its Net-Zero Vision (announced November 1, 2021) that seeks to achieve zero-net-GHG emissions for its gas LDC services by 2050.

An additional step for Public Service was the filing of its first Gas Infrastructure Plan ("GIP") on May 18, 2023, which provided additional transparency into the Company's gas planning and upcoming projects, developed an infrastructure alternatives process, and laid out steps to begin further consideration of infrastructure alternatives. Importantly, the GIP begins to join infrastructure planning and emissions reduction planning, with some of the alternatives considered in the GIP further elaborated in the Company's testimony in this CHP proceeding.

Q. TAKING A STEP BACK, HOW DID THE 2019 LEGISLATIVE SESSION BEGIN THE CONVERSATION AROUND GAS LDC EMISSION REDUCTIONS IN COLORADO?

A. In 2019, the General Assembly passed House Bill 19-1261, which set economy-wide goals for GHG reductions and provided direction to the Air Quality Control Commission ("AQCC") to begin making progress toward those goals. Section 1 of House Bill 19-1261 sets a goal of a 26% reduction in statewide GHG emissions by 2025, a 50% reduction by 2030, and a 90% reduction by 2050, from a 2005 baseline.[5]

[5] House Bill 19-1261, § 1, codified at § 25-7-102(2)(g), C.R.S.

In conjunction with House Bill 19-1261, the legislature also passed Senate Bill 19-236, which created specific clean energy targets for qualifying utilities in the electric power sector: an 80% reduction by 2030 from a 2005 baseline, and a goal of using 100% clean energy resources by 2050 if technically and economically feasible.[6] The passage of those laws led to the filing of the Company's 2021 Electric Resource Plan and Clean Energy Plan, which the Commission approved last year in the historic settlement agreement in Proceeding No. 21A-0141E.[7]

Although House Bill 19-1261 did not impose any specific requirements on gas LDCs, the economy-wide goals began a conversation and drove regulatory actions around decarbonizing the gas system and other sectors of the economy where GHG emissions had not been previously regulated.

Q. WHAT STEPS DID COLORADO TAKE WITH RESPECT TO GAS LDC GHG EMISSIONS FOLLOWING THE 2019 LEGISLATIVE SESSION?

A. In November 2020, the Commission held an information meeting covering the statewide goals in HB 19-1261 and the future of the natural gas system. The Commission also opened Proceeding No. 20M-0439G as a repository for information relating to its investigation of natural gas utility GHG emissions.[8] The Commission held additional information meetings on February 1, March 31, and May 20, 2021, at which it heard presentations from the Company and other

[6] Senate Bill 19-236 § 5, codified at § 40-2-125.5(3)(a), C.R.S.
[7] *See* Decision No. C22-0459, in Proceeding No. 21A-0141E (mailed Aug. 3, 2022), *affirmed as modified on applications for rehearing, reargument, or reconsideration*, Decision No. C22-0559 (mailed Sept. 21, 2022).
[8] *See* Decision No. C20-0770, in Proceeding No. 20M-0439G (mailed Nov. 4, 2020).

industry, government, and nongovernmental organization stakeholders on topics including methane emissions, alternative fuels, and gas planning.

In January 2021, the Governor's Office released the Colorado Greenhouse Gas Pollution Reduction Roadmap ("GHG Roadmap"), a multi-agency analysis of the goals of HB19-1261 across all major sectors of the state's economy. With respect to the use of natural gas in homes and buildings, the GHG Roadmap states that:

> To advance near term GHG goals, Colorado needs to reduce fuel use in buildings and industrial processes through increasing energy efficiency, transitioning water and home heating and industrial operations to electricity where it is cost-effective, and reducing the GHG intensity of the gas that serves these uses. In the residential sector, this shift will provide additional co-benefits that include more comfortable homes and better indoor air quality. Requiring utilities to transition to lower emissions gas will create an incentive for investments in the development of biogas from sources such as agricultural operations and sewage treatment plants as well as spur investment in green hydrogen production.[9]

The GHG Roadmap recognized that Coloradans will continue to use natural gas as a heating fuel, but that efficiency, electrification, and the use of lower-GHG-intensity gas can reduce overall emissions from the gas LDC sector. Overall, the GHG Roadmap asserted that a 20% reduction of GHG emissions from 2005 levels for residential, commercial, and industrial fuel use (4.75 million tons statewide) was achievable by 2030.[10]

The GHG Roadmap also described the challenges in decarbonizing the gas LDC sector, stating that "[t]he emissions reduction trajectory will be more gradual

[9] Colorado Greenhouse Gas Pollution Reduction Roadmap (Jan. 14, 2021), at XIII.
[10] *Id.* at 70.

than in the electric sector, in part because there are fewer lower-cost technologies available and because many of the actions needed require action by utility customers, not just the utility company."[11] Noting that at the time Colorado did not have any requirements for gas distribution utilities to reduce GHG emissions,[12] the GHG Roadmap recommended legislation with a "technology neutral emissions standard" that could "allow a utility flexibility in the measures used to achieve the emissions reduction goals" and directing the Commission to "consider both the emissions reduction achieved and the cost of the plan."[13]

Q. WHAT STEPS DID THE GENERAL ASSEMBLY TAKE DURING THE 2021 SESSION TO ADDRESS GHG EMISSIONS FROM GAS LDCS?

A. The 2021 legislative session saw the General Assembly focus on the gas LDC sector, passing the Clean Heat Targets in Senate Bill 21-264 as well as laws promoting Beneficial Electrification (Senate Bill 21-246) and updating utility Demand Side Management programs (House Bill 21-1238). The General Assembly essentially took action on the findings of the GHG Roadmap by creating a nation-leading Clean Heat framework and pathways to increase beneficial electrification and gas DSM programming, aligned around a common, albeit challenging, objective: reducing GHG emissions from LDCs.

Taken together, the laws passed during the 2021 legislative session represent nation-leading first steps to address GHG emissions in the gas LDC sector and the beginning of a process to plan for the future of Colorado's gas

[11] *Id.* at 71.
[12] *Id.* at 70.
[13] *Id.* at 71.

utilities. The Clean Heat statute underlying our inaugural Clean Heat Plan directs the Commission to approve a Clean Heat Plan if it is in the public interest, balancing several considerations: (1) the clean heat targets; (2) additional air quality, environmental, and health benefits; (3) investments serving customers participating in income-qualified programs and living in historically impacted communities; (4) reasonable cost to customers; and (5) system reliability.[14] The Commission began the implementation of the legislature's directives with its rulemaking in Proceeding No. 21R-0449G, and that process continues today with the filing of the Company's application for approval of its first Clean Heat Plan—which will be the first Clean Heat Plan for any utility in Colorado.

Q. HOW HAS POLICY RELATING TO GAS LDC GHG EMISSIONS EVOLVED AT THE FEDERAL LEVEL?

A. To date, Congress has not enacted specific emission reduction targets or planning requirements for gas LDCs, leaving those decisions to the states. Congress has, however, provided support for LDC decarbonization in the form of funding mechanisms and tax credits for heat pumps, energy efficiency, and the development of hydrogen infrastructure.

Q. PLEASE DESCRIBE THE FEDERAL INCENTIVES FOR HEAT PUMPS.

A. The Inflation Reduction Act of 2022 ("IRA") created several programs that will work alongside the Company's DSM programs and will further incentivize customers and developers to opt for clean energy technologies. Section 13301 of the IRA

[14] § 40-3.2-108(6)(d), C.R.S.

incentivizes residential retrofitting by offering a tax credit of 30%, up to $2,000, of expenses for qualified building shell improvements, heat pumps, heat pump water heaters, biomass stoves, and biomass boilers. Section 50122 of the IRA creates rebates of up to $14,000 for a variety of residential measures including, among others, heat pumps used for space or water heating.

Q. PLEASE DESCRIBE THE FEDERAL INCENTIVES FOR THE DEVELOPMENT OF HYDROGEN INFRASTRUCTURE.

A. Both the Bipartisan Infrastructure Law ("BIL") and the IRA include efforts to stimulate investment in the hydrogen economy. The BIL includes $8 billion for regional clean hydrogen hubs to expand use in the industrial sector, $1 billion for a clean hydrogen electrolysis program to reduce costs of hydrogen production, and $500 million for clean hydrogen manufacturing and recycling initiatives to support equipment manufacturing and supply chains. The IRA established tax credits for clean hydrogen production, with incentives starting at $0.60/kg for hydrogen production that can capture steam methane reformation ("SMR") process carbon emissions, with requirements for workforce development and wages. With the subsidy provided by the IRA, zero-carbon hydrogen can be cheaper than SMR produced hydrogen.

Q. IS THE COMPANY TAKING ADVANTAGE OF THESE INCENTIVES FOR HYDROGEN?

A. Yes. The Company is participating in an application for a $1.25 billion grant from the U.S. Department of Energy ("DOE") for a Western Interstate Hydrogen Hub ("WISHH") to advance the hydrogen economy across four Mountain West states:

Colorado, New Mexico, Utah and Wyoming. The application includes eight projects selected through a competitive solicitation project. The Company is sponsoring one of the selected projects, which is designed to produce clean hydrogen in eastern Colorado for a variety of uses, including in electric generation and in hard-to-decarbonize sectors. This project is discussed in additional detail in the testimony of Company witness Mr. Jensen.

Q. DOES THE COMPANY'S CHP INCORPORATE ANALYSIS OF OTHER TAX INCENTIVE EFFECTS?

A. Yes. Federal tax incentives will likely also drive increased heat pump adoption. We have modeled this effect as described later in the Direct Testimony of E3 expert Mr. Daniel Aas, who testifies on behalf of the Company in describing the modeling done by E3 in support of the Clean Heat Plan. The policy support environment for heat pumps is dynamic, with federal policies joining with state and utility incentives, and sometimes municipal incentives. The Company will continue to take advantage of and monitor these policies through the implementation of this CHP, our DSM programs, and also in future CHP and DSM proceedings.

Q. TURNING BACK TO STATE POLICY, HAS THE GENERAL ASSEMBLY RECENTLY ADJUSTED THE ECONOMYWIDE GHG EMISSIONS REDUCTION GOALS?

A. Yes. In the recently concluded 2023 legislative session, the General Assembly passed and Governor Polis signed into law Senate Bill 23-016. That legislation created a net-zero GHG statewide emissions reduction goal in 2050, and interim statewide GHG emissions reduction goals in five-year increments (a 65 percent

emissions reduction from 2005 levels in 2035, a 75 percent emissions reduction from 2005 levels in 2040, and a 90 percent emissions reduction from 2005 levels in 2045). The Clean Heat Targets from Senate Bill 21-264 for 2025 and 2030, respectively, remain in place (as do the statewide interim targets for 2025 and 2030), but Senate Bill 23-016's new statewide goals coupled with the overall State energy policy inform our long-term thinking about the Clean Heat planning process and the future of our gas LDC system.

Q. HOW HAS THE 2023 LEGISLATIVE SESSION INFORMED THE COMPANY'S VIEW OF THE CLEAN HEAT PLANNING PROCESS?

A. Although the long-term statewide goals in Senate Bill 23-016 are not specifically binding on gas LDCs (because the Clean Heat statute controls with its Clean Heat Targets and requirements for the filing of Clean Heat Plans),[15] they clarify the economywide path forward over the long term. In this Clean Heat Plan proceeding, the primary focus will be the 2025 and 2030 Clean Heat Targets set in Senate Bill 21-264. The Company's next Clean Heat Plan, which will have an action period that extends past 2030 when the 22 percent reduction target becomes effective, will also have a strong focus on the 2030 target. At the same time, our decisions made in these first proceedings must give us the best chance for success in future Clean Heat Plans. In Senate Bill 21-264, the General Assembly in subsections 10 and 11 of § 40-3.2-108, C.R.S. directed the Commission to set an additional Clean Heat Target for 2035 by December 1, 2024; and then to set additional targets for

[15] *Compare* § 40-3.2-108, C.R.S. (requiring approval of Clean Heat Plans), *with* § 25-7-102(g), C.R.S. (setting forth statewide "goals").

2040, 2045, and 2050 by December 1, 2032. Importantly, the Commission must set those targets in a manner that aligns with the statewide emissions reduction goals in § 25-7-102, C.R.S.[16] While those targets will be the subject of future Commission rulemakings, the new 2050 net-zero goal in Senate Bill 23-016 provides clarity around the direction of statewide emissions, i.e., to net-zero in 2050. This also aligns with the Company's Net-Zero Vision and planning already in progress to execute on that vision. In short, Senate Bill 23-016 provides additional impetus for the Commission, Company, and stakeholders to begin a new phase of long-term scenario planning for the Company's gas LDC business.

Q. HOW SHOULD THE COMMISSION APPROACH THAT LONG-TERM PLANNING TASK IN THIS PROCEEDING?

A. The task before the Commission in this Proceeding is the approval of a 2024-2028 Clean Heat Plan for the Company, and the decision points for future Clean Heat Targets and Clean Heat Plans will come in future proceedings. Nevertheless, we can build a bridge to those proceedings by beginning to analyze the many questions surrounding a net-zero future. The Company's filing today focuses on the formal Clean Heat Plan application for 2024-2028. In addition, it includes a broader discussion (in Section XIII of my Direct Testimony) of long-term scenarios on which the Company seeks stakeholder and Commission input, recognizing this discussion is based on indicative forecasts with substantial uncertainty and is designed to begin a long-term dialogue. This long-term planning exercise reflects

[16] § 40-3.2-108(10)-(11), C.R.S.

the Company's commitment to its Net-Zero Vision and our recognition of the need to begin work now with the Commission, the General Assembly, our customers, industry partners, community organizations, and other stakeholders in order to achieve success for our customers, the State of Colorado, and our business as a whole over the next 27 years.

Q. WHAT SCENARIOS DOES THE COMPANY ENVISION UNDER AN EVENTUAL NET-ZERO BY 2050 CLEAN HEAT TARGET?

A. Given the statewide 2050 goal, the Clean Heat planning process, and the Company's own Net-Zero Vision, we believe there are fundamentally two competing visions for the future of the Company's gas LDC, although there are potentially variations in between. In one world, we begin to make investments to transform our LDC system fuel sources, while also continuing to make fundamental investments for safety and reliability reasons A gas system remains in place in 2050, but with lower throughout and using a mix of molecules from different and cleaner sources. The Company pursues a suite of options that balance customer costs and the maximum practicable progress toward net-zero emissions. In another world, we move toward full electrification, and assist our customers with a transition to all-electric heating, cooking, and industrial production—and prepare for a future in 2050 where the gas system is significantly substantially smaller and may not exist.[17]

[17] The Company portrays the 2050 endpoint without a gas system for discussion and informational purposes, but notes that some much more limited role for a gas system, perhaps a 100 percent clean one, may remain even under this second scenario, as certain industries and uses for natural gas may be difficult to replace with electrification.

Q. WHAT DO THOSE COMPETING VISIONS MEAN FOR COLORADO?

A. There are many layers to this question, and the most important layer from our perspective is what it means to our customers from a cost and policy standpoint. There are many assumptions that underlie the scenarios designed to generally reflect these visions that will need to be refined over time as new technologies mature and as the Company learns from implementing its first Clean Heat Plans over the next 5-10 years. The technical and economic issues are numerous. There are also complex legal and regulatory questions that will need to be addressed, both by the Commission and by the General Assembly, as we move forward.

Section XIII of my testimony discusses the results of the Company's long-term scenario planning exercise in more detail. The Company is not attempting to provide answers today to all of the issues we will need to address between now and 2050, but rather seeking to put forward a reasonable first analysis based on current information that can serve as a starting place for discussion among the Commission and the parties. We believe this proceeding is the appropriate forum to begin exploring these issues and moving toward a decision between the two future scenarios, and the scenario-planning portion of our Clean Heat Plan application is designed to advance that dialogue in partnership with the Commission and interested stakeholders.

Q. DOES THE COMPANY HAVE A PREFERENCE FOR ONE LONG-TERM SCENARIO OVER THE OTHER?

A. Not at this time. The discussion around long-term GHG emission reduction planning for gas LDC systems that began in the 2019 legislative session will continue for many years. The Company is not proposing that the Commission choose between the two visions generally reflected in these scenarios—doing so would be premature and beyond the scope of this proceeding. Nor is the Company advancing one long-term vision as its preference.

To be clear, the Company expects that its view between these visions (or some point in between) will evolve during and, even more so, after this proceeding as future Clean Heat Plans are filed and adjudicated. We expect that the implementation of this Clean Heat Plan, combined with future Clean Heat Plans and Gas Infrastructure Plans, will inform the Company, the Commission, customers, and stakeholders as to the appropriate endpoint to plan for. This process will take years. For now, however, the Company's testimony regarding long-term scenario planning has a more limited purpose: to begin to inform the conversation based on initial best estimates and current information of the costs, technology measures, policy choices, and challenges involved in the two fundamental visions for the Company's gas LDC system through 2050. This long-term scenario planning will continue to be informed by technology developments, policy evolutions, system reliability considerations, and further study—just as it was and is with our electric business. We present them here to begin that dialogue.

Against that backdrop, the Company believes that its preferred portfolio provides the best pathway for the current Clean Heat Plan action period regardless of which scenario, or whether some scenario in between or another variation that emerges over time, is eventually chosen by Colorado for 2050. As I discuss later in my testimony, the Clean Heat Plus actions do not lock the Company into either of the two fundamental pathways to 2050, while providing what the Company believes is the best balance of emission reductions and customer costs over the next 5 years. Thus, although this first Clean Heat Plan is not required to meet a 2050 emissions reduction goal, the Company believes an additional benefit of its preferred portfolio is that it puts us in the best position to achieve Colorado's 2050 statewide goals regardless of the long-term path that we undertake, a path that will be informed by the General Assembly, the Commission, and stakeholders.

Q. PLEASE SUMMARIZE THE KEY TAKEAWAYS FROM THIS SECTION OF YOUR TESTIMONY.

A. The passage of the Clean Heat statute in 2021 represents a fundamental shift in long-term planning for the gas LDC sector. GHG emission reduction policy is still in its infancy on the gas side, and the Company's first-in-Colorado Clean Heat Plan is an important step on the path to fostering the markets and technologies that will allow us to successfully implement state policy. This year's legislative session saw the General Assembly strengthen the statewide GHG emission reduction goals, which inform the long-term Clean Heat process and align with the Company's Net-Zero Vision. Although we cannot answer all questions relating to what the gas LDC business will look like in 2050, we believe this proceeding is the appropriate

forum to start exploring those questions. To that end, the Company's application contains both a Clean Heat Plan for 2024 through 2028 and a long-term scenario planning exercise for 2050.

In the following sections of my testimony, I discuss the elements of the Company's Clean Heat Plan and the request for Commission approval of the Company's preferred portfolio. I conclude my testimony with a discussion of the long-term scenario planning exercise for 2050, on which the Company seeks Commission and stakeholder input.

III. CLEAN HEAT PLAN PORTFOLIOS CONSIDERED BY THE COMPANY

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

A. This section of my testimony discusses the resource portfolios analyzed by the Company in this Clean Heat Plan; the modeling results of the resources selected, costs, and emission reductions for each portfolio; and the Company's considerations in selecting a preferred portfolio.

A. Introduction to Portfolios Analyzed

Q. WHAT IS THE PURPOSE OF THE MODELING AND ANALYSIS OF VARIOUS CLEAN HEAT PORTFOLIOS CONDUCTED BY THE COMPANY IN SUPPORT OF ITS APPLICATION?

A. The portfolio modeling exercise is designed to assist the Commission in addressing the two fundamental questions it must answer in its decision in a Clean Heat proceeding. First, what is the interrelationship between costs and emission reductions for a utility's gas system, and how should the Commission strike the appropriate balance between the two? Second, what emissions reduction measures should the utility use to achieve the level of reduction that the Commission chooses?

Q. PLEASE PROVIDE AN OVERVIEW OF THE PORTFOLIOS ANALYZED BY THE COMPANY IN THIS CLEAN HEAT PLAN APPLICATION.

A. The Company's Application follows the requirements of Senate Bill 21-264 and Commission Rules, which are discussed in more detail in Section VII of my

testimony. This Clean Heat Plan covers an action period of 2024 through 2028[18] and the Clean Heat Target for 2025.[19] The trajectory toward the Clean Heat Target for 2030 is also top of mind for our planning purposes as it follows soon after the end of the action period for this plan.[20]

The Clean Heat statute requires a gas utility to present two mandatory portfolios—one that is constrained by a requirement that it comply with the cost target, and one that meets the applicable Clean Heat Targets without the constraint of the cost target. We refer to these first two portfolios as the "Cost Target" and "Emissions Target" portfolios. Together, the two mandatory portfolios are guideposts that frame first fundamental question regarding the balance between costs and emission reductions, and the Emissions Target portfolio provides important information about the mix of emissions reduction measures under certain constraints.

Under the Clean Heat statute, utilities may also submit additional portfolios. The Company is submitting two additional portfolios in its Direct Case, both of which provide additional information about how to balance costs and emissions reductions and what the optimal mix of resources to cost-effectively achieve maximum emissions reductions may look like. The first of these portfolios is an "Electrification Only" portfolio reflecting steeply aggressive electrification in which

[18] Rule 4727(b).
[19] § 40-3.2-108(4)(a), C.R.S.; Rule 4729(b)(II).
[20] *See* Rule 4729(b)(III) (a Clean Heat Plan application must "demonstrate that the activities contemplated in the clean heat plan facilitates the utility's ability to meet future greenhouse gas emission reduction targets").

the pace of customer gas appliance retrofits is accelerated beyond the pace predicted in the Colorado GHG Roadmap

The second additional portfolio included in the Direct Case is the Company's Clean Heat Plus portfolio, which balances costs and emission reductions by allowing for the selection of a full suite of enumerated Clean Heat Resources and additional emissions reduction measures that will balance emission reductions and cost considerations. The Clean Heat Plus portfolio is the Company's preferred portfolio and is discussed in Section IV of my testimony. Finally, the modeling includes additional sensitivity analyses on these portfolios. These sensitivity analyses are described in greater detail in the testimony of Company witness Mr. Aas.

Table JWI-D-1: Overview of Clean Heat Portfolios

	Portfolio	Achieve 2030 Emissions Target	Clean Heat Resources	Additional Measures
<$	Cost Target	No	EE+BE+RM+H_2	–
	Emissions Target	Yes	EE+BE+RM+H_2	–
	Electrification Only	Yes	EE+BE	–
	Clean Heat Plus	Yes	EE+BE+RM+H_2	Differentiated gas, carbon offsets

Table Notes: "EE" is energy efficiency, "BE" is beneficial electrification, "RM" is recovered methane as set forth in SB 21-264, and "H_2" is hydrogen.

Q. PLEASE DESCRIBE THE MODEL USED IN THE COMPANY'S ANALYSIS.

A. The Company retained Energy and Environmental Economics, Inc. ("E3"), a leading energy analysis firm with an established background in analysis focused on reducing GHG emissions associated with gas LDCs, to model the portfolios presented in this Clean Heat Plan. The Commission is familiar with E3's work, including as the lead technical consultant to the Governor's Office for the modeling presented in the GHG Roadmap. Company witness Mr. Daniel Aas, a Director at E3, provides much further background on the modeling conducted in his Direct Testimony, but in brief form, the E3 model seeks to obtain the most cost-effective mix of emissions reduction options available to meet a given GHG reduction target. The model used a blend of input assumptions developed by E3, and by the Company, in a collaborative effort to calibrate the model to the conditions under which a Colorado LDC operates. In essence, E3 used these input assumptions to develop supply curves for emissions reduction or, stated another way, marginal

emissions abatement curves. The model seeks the most cost-effective mix of resources based on these supply curves and considering the various constraints and resource combinations described above.

Q. DID THE ANALYSIS CONSIDER THE EFFECTS OF PLANNED GAS ENERGY EFFICIENCY AND ELECTRIFICATION?

A. Yes. Working with E3, we estimated the effects of the Company's Proceeding 22A-0309EG, the DSM and BE Strategic Issues case, as available during the course of our modeling efforts. We captured the emissions reduction effects of that case as part of our emissions forecasting. However, we did not include the costs of DSM and BE arising from that case in the CHP costs, as those DSM and BE activities have their own cost recovery mechanisms, and we are not seeking recovery of those costs in this Proceeding.

Q. PLEASE DESCRIBE THE "COST TARGET" PORTFOLIO IN MORE DETAIL.

A. The Cost Target portfolio responds to the statutory directive to present "[a] portfolio of resources that uses clean heat resources to the maximum practicable extent, that complies with the cost cap, that may include leak reductions approved by the Commission, and that may or may not meet the clean heat target in the applicable plan period but that demonstrates reductions in methane emissions."[21] This portfolio includes the enumerated Clean Heat Resources: gas DSM, recovered methane, green hydrogen, and beneficial electrification. The model produces the portfolio with the maximum emission reductions subject to the statutory 2.5 percent

[21] § 40-3.2-108(4)(c)(II)(A), C.R.S.

cost cap, which the Company calculated to be, on average, $34 million from 2024 – 2028, for a total of $170 million over that time period.[22] As described in the discussion of the modeling results in subsection B below, this portfolio does not meet the Clean Heat Targets for either 2025 or 2030.

Q. PLEASE DESCRIBE THE "EMISSIONS TARGET" PORTFOLIO IN MORE DETAIL.

A. The Emissions Target portfolio responds to the statutory directive to present "[a] portfolio that meets the clean heat targets in the applicable plan period using only clean heat resources but that need not meet the cost cap."[23] This portfolio selects from the same resources as the Cost Target portfolio but can "spend" the needed funds to do so, even if they exceed the statutory 2.5 percent cost target. To achieve this, an increased pace and achievement of beneficial electrification is required.[24]

Q. PLEASE DESCRIBE THE "ELECTRIFICATION ONLY" PORTFOLIO IN MORE DETAIL.

A. The "Electrification Only" portfolio gives primacy to beneficial electrification measures as some advocates have suggested. This portfolio allows only the selection of beneficial electrification and related DSM (e.g., shell measures). As with the Emissions Target portfolio, the Electrification Only portfolio modifies the

[22] The modeling considered the availability of benefits of some federal tax incentives in a manner allowing additional headroom under the 2.5 percent cost target. Mr. Aas's Direct Testimony describes this in further detail.
[23] § 40-3.2-108(4)(c)(II)(B), C.R.S.
[24] None of the portfolios modeled by E3 are able to achieve the 2025 Clean Heat Target given the assumed availability of emission reduction measures.

baseline assumptions under the Colorado GHG Roadmap regarding the pace of electric appliance (e.g., heat pump) uptake to allow the portfolio to meet the 2030 Clean Heat Target. Achieving this model constraint required a significant increase in the pace of electrification as compared to the Colorado GHG Roadmap. Whereas in the other three portfolios a mix of hybrid and all-electric retrofits is allowed, in Electrification Only, only all-electric replacements are permitted. The model is constrained to meet the 2030 Clean Heat Target. This is a useful portfolio to better understand the scale of change and magnitude of costs under a potential future in which the gas system may not be available to provide supplemental heating while using hybrid heat pump systems on the coldest days of the year.

Q. ARE THERE ANY PARTICULAR ASSUMPTIONS IN THESE PORTFOLIOS YOU WANT TO HIGHLIGHT FOR DISCUSSION?

A. The modeling performed by E3 is the first comprehensive effort to model different futures for the LDC that the Company has presented, and I am not aware of many similar exercises performed by other LDCs and presented to state utility commissions in other parts of the country. I note that because there are numerous assumptions embedded in the modeling, and these can be refined over time as we learn more and gain experience in Clean Heat Plan implementation. The need for learning is particularly acute in the context of LDC emissions reduction efforts given the need for individual customer actions to contribute to emissions reductions efforts, which makes this effort distinctly different than reducing emissions on our electric system. I do think, however, that the pace and scale of retrofit heat pump sales assumption is worthy of a brief discussion.

Q. PLEASE EXPLAIN.

A. Under our baseline assumption, based on the Colorado GHG Roadmap, the percent of heat pump retrofit sales rises from less than 10 percent in 2024 to more than 50 percent in 2030 depending on the sector and technology. Even that assumption may be optimistic. At minimum, it is untested in the market in Colorado. For the Emissions Target and Electrification Only scenarios, an even faster pace of adoption is allowed by the model, roughly two to three times as much as the Roadmap-based baseline assumptions in order for those portfolios to meet the 2030 Clean Heat Target. Company witness Mr. Aas describes the logic behind this approach to modeling these portfolios, which allows a comparison of the costs and rate of electrification adoption needed to meet the 2030 Clean Heat Target.

Q. PLEASE DESCRIBE THE CLEAN HEAT PLUS PORTFOLIO IN MORE DETAIL.

A. The Clean Heat Plus portfolio includes all of the Clean Heat Resources enumerated in the statute, but is not limited to those resources, adding certified, or differentiated, natural gas ("CNG") and emissions offsets (together, "Additional Measures") to the mix of potential emission-reduction tools. As discussed in the next section of my testimony, the Commission has the authority to approve the use of these Additional Measures under the Clean Heat Statute as part of a diverse Clean Heat Plan. The model for the Clean Heat Plus portfolio is constrained to meet the Clean Heat Targets and produces the lowest-cost achievement of equivalent 2030 emissions reductions, by using both Clean Heat Resources and Additional Measures. Clean Heat Plus is the Company's preferred portfolio, and I discuss this proposal in more detail in Section IV of my testimony.

Q. IS THE COMPANY PRESENTING ANY PORTFOLIOS IN ADDITION TO THE COST TARGET, EMISSIONS TARGET, ELECTRIFICATION ONLY, AND CLEAN HEAT PLUS PORTFOLIOS?

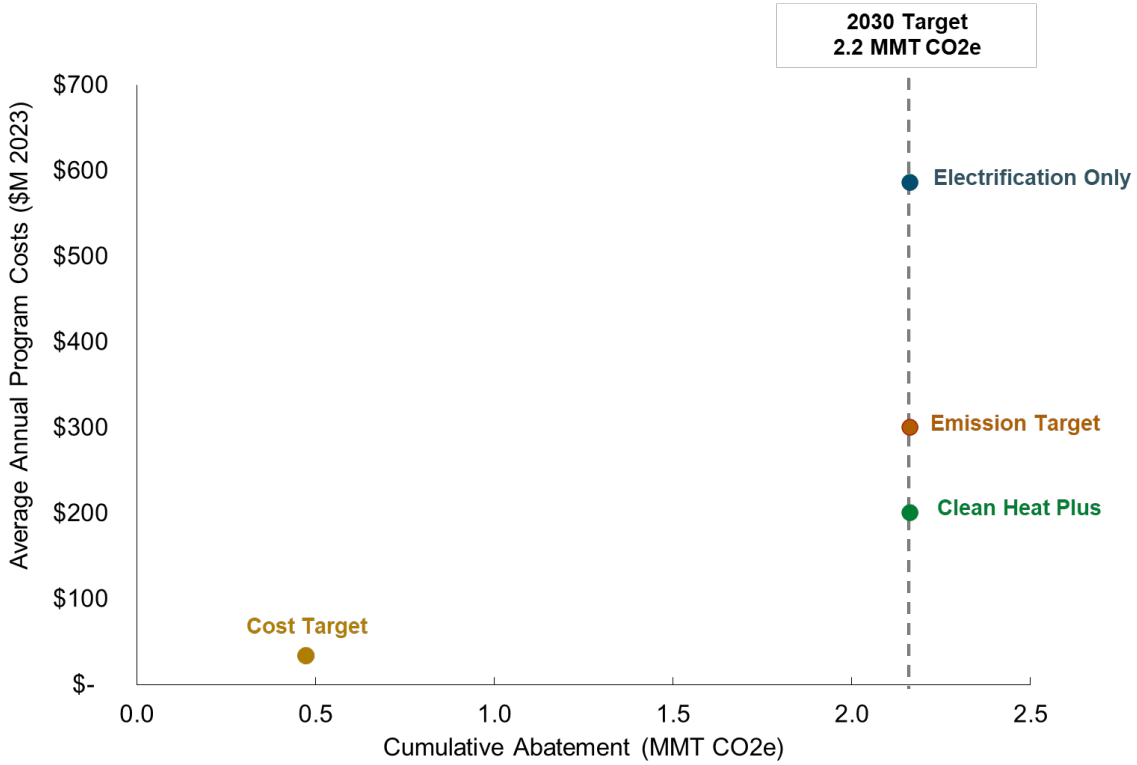
No. As I discuss next, the modeling results from the four portfolios show a range of paths forward during the 2024 to 2028 action period for this Clean Heat Plan. The two mandatory portfolios frame the tradeoffs between costs and emission reductions, and Clean Heat Plus is the Company's effort to strike a balance between those considerations. The Electrification Only portfolio provides additional insight into assumptions relating to rapid electrification.

B. Modeling Results for Portfolios Analyzed

Q. WHAT ARE THE HIGH-LEVEL COST AND EMISSION REDUCTION RESULTS FROM MODELING THE FOUR PORTFOLIOS?

A. A high-level comparison across costs and emissions comparing the four portfolios of the Company's modeling is shown in Figure JWI-D-1 below.

Figure JWI-D-1: Emission and Cost Results Through 2030 Across Four Portfolios

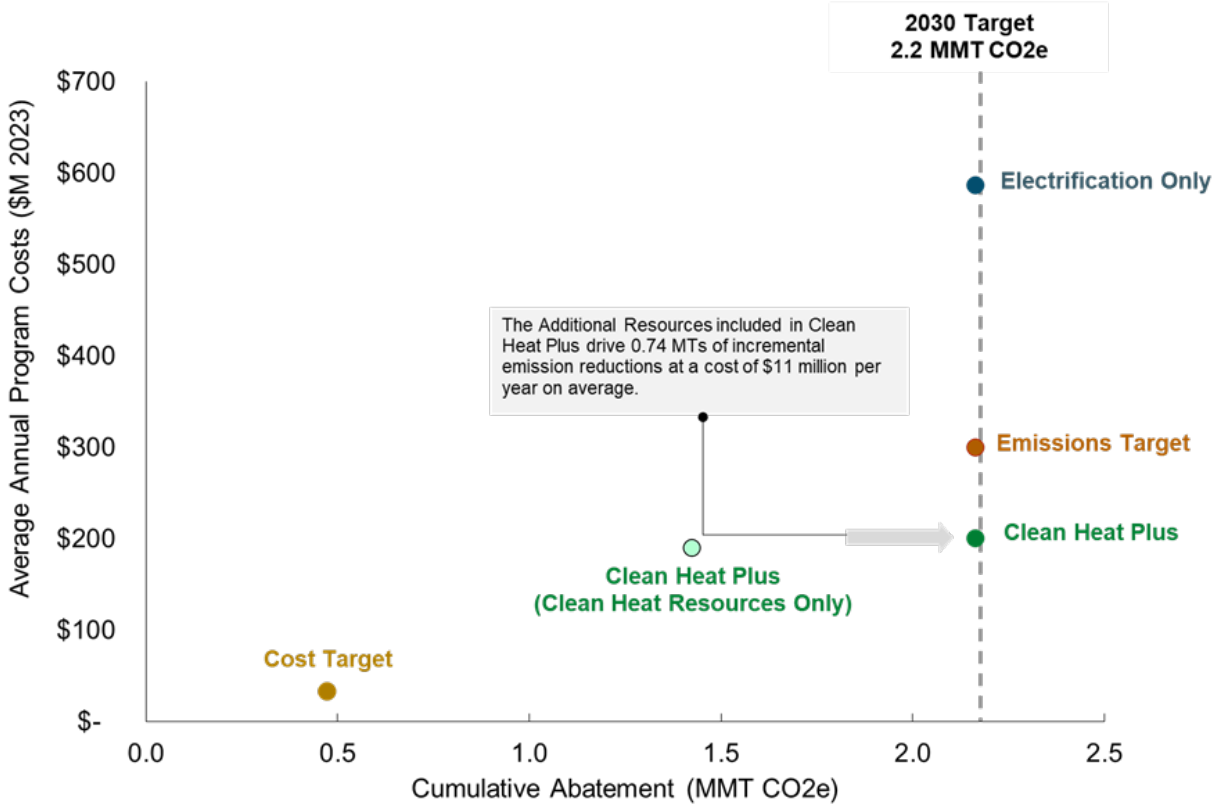


The plots in this figure show the annual total emissions abatement and total program costs for each portfolio in 2030. Portfolios with dots further to the right on the x-axis achieve greater emission reductions, with the dashed vertical line showing the level needed to meet the Clean Heat Target. Portfolios with dots higher up on the y-axis have greater total costs.

A fundamental finding from this analysis is that the Cost Target portfolio falls far short of the emissions target. Conversely, the three portfolios that do achieve the 2030 emissions target all exceed the cost target, and some much more than others. Another fundamental finding is that opening up more options among the portfolios achieving the emissions target reduces cost: the Electrification Only portfolio using the fewest options is the most expensive of the three; the Emissions

Target portfolio brings in additional Clean Heat resources and shows lower cost; and Clean Heat Plus, which brings in further additional measures beyond the Clean Heat Resources, achieves the same emissions reductions at a substantially lower cost than Emissions Target. I want to stress that the Clean Heat Plus emissions reductions do rely on emissions reductions from upstream sources, and also carbon offsets, to obtain some of the reductions. Figure JWI-D-1 above presents those emissions as equivalent, for the sake of an economic comparison. When considering only the portion of the emissions reductions from Clean Heat Plus that result from its use of Clean Heat Resources, the portfolio shows lower reductions than Emissions Target and Electrification Only (both of which devote their entire programmatic budgets to the enumerated Clean Heat Resources).

Figure JWI-D-2: Emission and Cost Results Through 2030 – Cost Effectiveness of Additional Resources



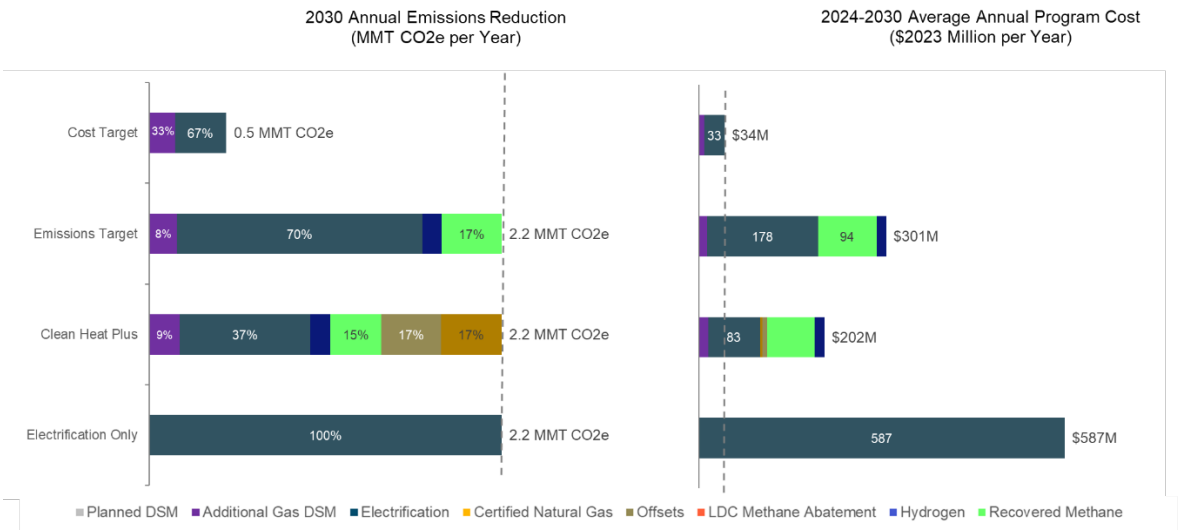
A final and critical point is the magnitude of costs implied here among the portfolios that reach the 2030 emissions target in the Clean Heat statute—they are relatively expensive. As a first-order estimate, applying these average annual program costs of $163-$472 million per year across the five-year action period to the current non-transport gas LDC revenue requirement shows an annual average increase of approximately 12-35 percent. As another data point, the annual program cost of these portfolios would be several times the annual collection rate of the Renewable Energy Standard Adjustment. I provide a more nuanced rate impact estimate from the program costs later in my testimony in Section IX, which allocates costs to both gas and electric customers for reasons discussed in that

Section. I note here also that these program costs do not include any costs for incremental grid investments, and do not reflect the investment costs that customers would pay, after incentives and rebates, for the electrification actions at their home or business that they would undertake under these programs.

Q. WHAT ARE THE EMISSIONS REDUCTIONS AND COSTS BY RESOURCE TYPE ACROSS PORTFOLIOS?

A. Figure JWI-D-3 below provides a visual summary of the emissions reductions and costs by resource type.

Figure JWI-D-3: Emissions Reductions and Costs by Resource Type



A clear point made by JWI-D-3 is the strong role that electrification plays across all portfolios. Electrification provides the most emissions reduction of any option across all portfolios, and in the target-achieving portfolios it represents a level of electrification activity far above that contemplated in the current DSM Strategic Issues proceeding (Proceeding No. 22A-0309EG) as discussed extensively by Company Witness Mr. Nick Mark. Electrification is also the largest

portion of the incremental program budget for all portfolios. Another point shown in Figure JWI-D-3 is the "bang for the buck" that Clean Heat Plus gets from its diverse portfolio. Some of the resources with quite small relative costs in Clean Heat Plus still create meaningful reductions. Notably they can do so without direct customer participation, which is a prerequisite for electrification and efficiency efforts.

Q. WHAT ARE SOME ADDITIONAL RESULTS ON THE GAS AND ELECTRIC SYSTEM FROM THE FOUR PORTFOLIOS?

A. Table JWI-D-2 below shows some additional data across the four portfolios that is indicative of how the portfolios affect our gas and electric systems.

Table JWI-D-2: Additional Results from the Four Portfolios

Portfolio	Portfolio Description	Emission Reductions (MMT)	Total Program Cost ($M)	Customer Costs ($M)	Incremental Electric CapEx ($M)	Avoided Gas CapEx ($M)	Homes with Electrified HVAC	Gas Throughput (MDTH)
		Cumulative Effect Through 2030					In 2030	
Cost Target	Aims to meet 4% emissions reduction in 2025 and 22% reduction in 2030 with a balanced mix of resources	0.8	$293	$691	$251	-$75	All-Electric: 79K Hybrid: 19K	140 (94% of BAU)
Emissions Target	Aims to meet 22% reduction in 2030 with electrification trajectory to comply with emission target	2.2	$2,105	$3,504	$638	-$138	All-Electric: 159k Hybrid: 205K	110 (73% of BAU)
Electrification Only	Aims to meet 22% reduction in 2030 with electrification trajectory to comply with emission target	2.2	$ 4,110	$3,129	$5,815	-$354	All-Electric: 450K Hybrid: N/A	105 (70% of BAU)
Clean Heat Plus	Uses resources beyond those defined by statute (e.g., certified natural gas, offsets) to achieve emissions targets	2.2	$1,411	$2,374	$373	-$90	All-Electric: 89K Hybrid:115 K	124 (83% of BAU)

Table JWI-D-2 further illustrates some effects from the ambitious electrification shown in the respective portfolios. Under these portfolios, between 98,000 and 364,000 homes have either an All-Electric or a Hybrid electric retrofit. This incremental electric load could drive an additional 393 MW to 2,925 MW of customer demand on the grid, which we estimate to cost approximately $251 million to $5.8 billion by 2030. Also, all the portfolios that allow both All-Electric and Hybrid retrofits see both options coming into the mix. On the gas side, the four portfolios all continue to use the existing gas LDC system through 2030 at significant levels, with the lowest usage at 70% of annual system throughput under the Electrification Only portfolio. We have here again estimated system costs, but analyzing avoided gas system investments. We estimate those avoided costs at $75 million to $354 million by 2030.

Q. WOULD THE CUSTOMERS UNDERTAKING ELECTRIFICATION RETROFITS EXPERIENCE ADDITIONAL COSTS ACROSS THESE FOUR SCENARIOS?

A. Yes. The program costs we focused on in the E3 modeling do not factor in participating customers' personal investment costs for electrification retrofits. This is an additional aspect of the cost picture of all Clean Heat portfolios. With "gross" electrification retrofits costing in the neighborhood of $20,000 per household for an all-electric conversion (noting costs are site-specific), these costs are significant even after incentives, and likely to cost each household thousands of dollars. Across the portfolios, these customer investment costs range up to $3.5 billion by 2030 on a total after-incentives basis, though it is worth noting that such customers

would likely have "anyway" costs associated with replacing their end-of-life furnace with another gas furnace.[25]

Q. WHAT FACTORS DID THE COMPANY CONSIDER WHEN CHOOSING WHICH PORTFOLIO TO IDENTIFY AS ITS PREFERRED PORTFOLIO?

A. Commission Rules require the Company to identify a preferred portfolio that "best balances, given the information available," the goals of maintaining just and reasonable rates, maintaining system safety, reliability and resiliency, protecting disproportionately impacted communities, labor standards, and contribution to progress on meeting the statewide greenhouse gas emission reduction goals and the associated clean heat targets.[26] In addition, the Company considered all of the relevant criteria for a Clean Heat Plan set forth in Senate Bill 21-264 and Commission Rules 4725 to 4733. These are discussed in more detail in Section VII of my testimony. The Commission also considers the balance across a similar array of factors when determining whether a Clean Heat Plan and a utility's preferred portfolio are in the public interest.

In the Company's view, neither the Cost Target nor Emissions Target portfolios required by Senate Bill 21-264 represent an optimal path forward for our customers or the State of Colorado at this juncture and in this initial Clean Heat Plan because they represent polarities that fail to balance emissions and costs as the statute and Commission Rules require.

[25] "Anyway" costs are costs that the customer would incur to replace a gas appliance with a new gas appliance; in other words, it recognizes that at the end of life or failure, the customer will incur personal costs at some level whether or not they choose to electrify.
[26] Rule 4731(b)(I)(E).

Q. WHAT DO YOU MEAN BY THAT?

A. The Cost Target portfolio achieves only limited emission reductions, does not reach the Clean Heat Targets, and fails to motivate the growth of all available technology and policy solutions for decarbonizing the Company's gas system. The Emissions Target portfolio does meet the Clean Heat Target in 2030, but does so at a very high cost to customers, over $2 billion over the next 7 years in program costs alone. It is also limited to deploying only the enumerated Clean Heat Resources, a narrower than necessary approach that could increase the risk of failure.

The Commission is not limited to approving one of the two mandatory portfolios. Indeed, the requirements for the two mandatory portfolios and the approval criteria in the Clean Heat statute indicate that the Commission has broad discretion in its approval of a Clean Heat portfolio. The Company has endeavored to find a better balance between cost and emission reductions in the Clean Heat Plus portfolio, which I discuss in the next section. Clean Heat Plus makes the maximum practicable progress toward the 2025 Clean Heat Target, puts the Company on track to meet the 2030 Clean Heat, provides the most cost-effective combination of resources to achieve those emission reductions, and uses an all-of-the-above approach that gives us the best chance to enable new technologies in Colorado and meet the State's policy goals. Moreover, it meets these objectives while maintaining long-term flexibility and managing affordability in the near-term as our dialogue about the path to 2050 continues. Under the criteria in Rule 4731,

Clean Heat Plus represents the best balance of any portfolio presented in this filing, and the Company has accordingly selected it as its preferred portfolio.

IV. PREFERRED PORTFOLIO: "CLEAN HEAT PLUS"

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

A. This section of my testimony describes the Clean Heat Plus portfolio, how Clean Heat Plus fits within the framework of Senate Bill 21-264, and the policy rationale for choosing Clean Heat Plus as the Company's preferred portfolio.

A. Introducing the Clean Heat Plus Portfolio

Q. WHAT IS THE CLEAN HEAT PLUS PORTFOLIO?

A. Clean Heat Plus is a portfolio that utilizes a comprehensive set of emissions reduction options, including both the Clean Heat Resources enumerated in Senate Bill 21-264 and additional cost-effective emission reduction measures. To be more specific, Clean Heat Plus advances a robust set of Clean Heat Resources – electrification, efficiency, recovered methane, and hydrogen. It relies on 233,000 tons of already-planned emission reductions through efficiency and electrification efforts from the DSM Strategic Issues proceeding, and achieves an additional 916,000 tons of emissions reduction in 2028 through incremental Clean Heat Resources. Then, to drive more emissions reduction with an eye toward affordability and programmatic flexibility, it adds two more options – CNG and carbon offsets. These tools, which we refer to as "Additional Measures," add a further 694,000 tons of reduction in 2028, for a total of 1.6 million tons beyond the already-planned emissions reductions. The 2030 target requires 2.2 million tons of reduction, and Clean Heat Plus is projected to reach that target. The cumulative emission reductions and costs for the program are summarized below in Table JWI-D-3.

Table JWI-D-3: Overview of Clean Heat Plus Portfolio

Emission Reduction Category	Cumulative Emission Reductions 2024 – 2028 (MTs)	Cumulative Program Cost 2024 - 2028 $M	Role in Portfolio
Planned DSM	232,633	N/A	Supporting
Efficiency	152,292	$ 81	Clean Heat Resource
Electrification	453,436	$303	
LDC Methane Abatement	-	$-	
Hydrogen	53,723	$26	
RNG/Recovered Methane	256,438	$362	
CNG	329,147	$13	Additional Measures
Offsets	365,000	$31	
Clean Heat Plus Total	1,610,035	$816	

Q. HOW DID THE COMPANY DETERMINE THE MIX OF RESOURCES TO USE IN THE CLEAN HEAT PLUS PORTFOLIO?

A. As with our other portfolios, Clean Heat Plus is modeled to achieve the least-cost portfolio of resources given certain constraints. For Clean Heat Plus, we allow the model to select CNG and offsets along with the enumerated Clean Heat Resources, constrain the model to achieve (or make maximum progress toward) the 2030 Clean Heat Target, and then ask it to select the mix of resources that minimize costs for our customers. The mix of Clean Heat Resources and Additional Measures presented by the model is the result of this least-cost optimization.

Q. NOTING THAT THE COMPANY MAY PROPOSE HYDROGEN INVESTMENTS IN THE FUTURE, WHAT IS THE COMPANY PROPOSING HERE IN THIS CHP?

A. First, to be clear, and outside of the hydrogen blending project discussed in more detail later in my testimony, the Company is not making broader requests for approval or funding of specific hydrogen projects in this CHP. The Company is

presenting modeling for the Clean Heat Plus portfolio, and also the Emissions Target portfolio, which both show a role for hydrogen in the later years of the action plan period. We have proposed the Clean Heat Plus portfolio as our preferred plan. Our request here is to approve the Clean Heat Plus portfolio with the recognition that hydrogen may play a role in that portfolio in the later years of the action plan period, and not to fill that hydrogen "space" in the portfolio with other types of resources.

It is worth noting that the Company anticipates substantial developments on hydrogen after this plan filing. Hydrogen is a key potential component in how the Company is thinking about the futures of its business overall, not just its gas LDC business. Hydrogen is also a key potential fuel in how the State may think about the overall clean energy economy. Our modeling tracks with these outcomes in a reasonable representation of that potential role, consistent with processes under HB 23-1281 and with the potential DOE funding of the WISHH. But again, we seek no approval of a hydrogen project here, only approval of a portfolio that "holds a space" for hydrogen as brought forward in future Company filings to the Commission.

B. Policy Consideration of Additional Measures Under Clean Heat Plus

Q. DOES THE COMMISSION HAVE AUTHORITY TO APPROVE THE ADDITIONAL MEASURES IN THE CLEAN HEAT PLUS PORTFOLIO?

A. Yes. The Company's request to approve the Additional Measures in the Clean Heat Plus portfolio is consistent with Senate Bill 21-264 and the Commission's general authority to regulate the Company's gas LDC system.

The primary objective of Senate Bill 21-264 is that utilities submit for Commission approval Clean Heat Plans that make progress toward the mass-based Clean Heat Target emission standards, taking into account customer costs and other factors.[27] Although I am not a lawyer, and counsel can address any legal questions in the Company's Statement of Position, several provisions of the statute confirm my view that a Clean Heat Plan may meet this objective using both Clean Heat Resources as well as other tools such as the Additional Measures proposed by the Company in Clean Heat Plus.

Q. WHAT ARE THE PROVISIONS THAT YOU REFERENCE?

A. First, the statute defines a "Clean Heat Plan" as a "comprehensive plan" that demonstrates emission reductions.[28] The statute further defines "Clean Heat Resource" as meaning one of several categories of emission-reduction measures.[29] Notably, the statutory definition of "Clean Heat Plan" does not limit a plan to *only* using Clean Heat Resources.[30]

Second, the Commission reviews Clean Heat Plans on a public interest balancing standard. One factor in that review is "[w]hether the clean heat plan achieves the clean heat targets through maximizing the use of clean heat resources."[31] The addition of the word "maximizing" in this provision indicates that a Clean Heat Plan must maximize the use of Clean Heat Resources, not that it must use them exclusively.

[27] § 40-3.2-108(3)-(6), C.R.S.
[28] § 40-3.2-108(1)(b), C.R.S.
[29] § 40-3.2-108(1)(c), C.R.S.
[30] § 40-3.2-108(1)(b), C.R.S.
[31] § 40-3.2-108(6)(d)(I)(A), C.R.S.

Third, the provisions regarding plan approval are explicit as to what portion of a plan must consist of Clean Heat Resources. The statute states that the Commission must require a utility to achieve "the maximum level of greenhouse gas emission reductions practicable using clean heat resources at or below the cost cap," but also that it may approve a plan with costs greater than the cost cap if the plan "is in the public interest."[32] Reading these provisions together, we see that: (1) while a utility may not spend *less* than the cost cap if additional emission reductions are yet practicable using Clean Heat Resources; and (2) once the utility has achieved the maximum emission reductions practicable using Clean Heat Resources, it may still achieve additional emission reductions by spending additional money up to or above the cost cap, and that spending is not restricted to Clean Heat Resources.

Q. HOW WOULD YOU APPLY THESE PROVISIONS TO THIS CLEAN HEAT PLAN?

A. In the Company's case, we can fill the cost cap with Clean Heat Resources, and it is in the public interest to achieve further emission reductions with spending above the cost cap using both additional Clean Heat Resources and the Clean Heat Plus Additional Measures. The modeling results for the Clean Heat Plus portfolio optimize both the use of Clean Heat Resources to the maximum extent possible and the use of the Additional Measures to make maximum progress toward the

[32] § 40-3.2-108(6)(d)(II)(B), (6)(d)(III), C.R.S.

Clean Heat Targets in the most cost-effective manner of any of the portfolios we modeled.

Q. DO YOU HAVE ANY OTHER COMMENTS REGARDING THE LANGUAGE USED IN THE STATUTE?

A. Yes. Additional confirmation that the statute contemplates that utilities will employ both the Clean Heat Resources and additional emission-reduction measures in a Clean Heat Plan can be found in the description of the portfolios a utility is required to submit. A utility must present a portfolio that complies with the cost cap that is "[a] portfolio of resources that uses clean heat resources to the maximum extent possible."[33] This provision discusses that Clean Heat Resources as one type or subset of the "resources" that may be included in a portfolio, making clear that there are also other, non-enumerated "resources" that may be included.[34] This indicates that the General Assembly contemplated that the cost-cap portfolio could include additional, non-Clean Heat Resource mechanisms if the practicable emission reductions achievable using Clean Heat Resources did not exhaust the cost cap, though that is not the case in the Company's modeling. A utility must also present "[a] portfolio that meets the clean heat targets in the applicable plan period using *only* clean heat resources but that need not meet the cost cap."[35] The use of the word "only" in this provision reinforces the concept that other mechanisms

[33] § 40-3.2-108(4)(c)(II)(A), C.R.S. (emphasis added).
[34] Although CNG and offsets could properly be described as "resources" under this provision, the Company uses the phrase "Additional Measures" to avoid confusion.
[35] § 40-3.2-108(4)(c)(II)(B), C.R.S. (emphasis added).

may be used in a Clean Heat Plan, though they may not be included in the Clean Heat Resource-only emissions-cap portfolio.

The statute also allows a utility to present "other portfolios at the utility's discretion" (referred to in Commission Rules as "other alternative portfolios"), with no specific restrictions regarding the use of Clean Heat Resources or other mechanisms.[36] The General Assembly used permissive language in this provision, as opposed to the more prescriptive language with respect to the two required portfolios. When read together with the phrases "portfolio of resources" and "using only clean heat resources" in the neighboring provisions, the "other portfolio" provision demonstrates the General Assembly's intent to encourage a utility to submit the best possible portfolio using all available tools to reduce emissions in a cost-effective manner. Moreover, the Commission may approve portfolios that take such an approach. A Clean Heat Plan is in "compliance" with the statute if it "utilize[s] clean heat resources to the maximum extent practicable."[37] The Commission may approve a portfolio containing a combination of Clean Heat Resources and additional measures so long as it meets that criterion, which the Company's Clean Heat Plus portfolio does.

[36] § 40-3.2-108(4)(c)(II)(C), C.R.S.; Rule 4731(b)(I)(C). These portfolios are subject to the requirement to maximize the use of Clean Heat Resources up to the level that is practicable and at or below the cost cap, as discussed above.
[37] § 40-3.2-108(4)(d)(I), C.R.S.

Q. WHAT IS YOUR VIEW, FROM A POLICY PERSPECTIVE, OF THE GENERAL ASSEMBLY'S FRAMING OF THE REQUIRED AND OPTIONAL PORTFOLIOS?

A. While there is sound policy behind the General Assembly's approach, the sponsors of Senate Bill 21-264 could not have known what the best way to make progress toward the Clean Heat Targets would be for the Company or for any other gas utility. It thus encouraged the use of the Clean Heat Resources through the "maximum . . . practicable" requirement and the requirement to submit the two mandatory portfolios but left it to the utilities and the Commission to determine whether other mechanisms could be used in conjunction with the Clean Heat Resources to optimize a Clean Heat Plan. The Company has proposed two such mechanisms in this Proceeding, but others may emerge as new technologies are developed that we cannot currently anticipate. A contrary approach, limiting Clean Heat Plans to only the enumerated Clean Heat Resources, would leave cost-effective emission reductions on the table and prevent utilities from employing emerging technologies in the future. That would be poor policy in my opinion, and there is no indication that the General Assembly intended to write such a limitation into Senate Bill 21-264.

Q. MOVING BEYOND SENATE BILL 21-264, DOES THE COMMISSION HAVE OTHER AUTHORITY THAT ALLOWS IT TO APPROVE THE ADDITIONAL MEASURES IN THE CLEAN HEAT PLUS PORTFOLIO?

A. Yes. As additional or alternative authority, the Company's request to approve the Additional Measures falls within the scope of the Commission's broad authority to regulate public utilities, and the request can be approved as part of the Company's

properly noticed Application. The Additional Measures reduce the GHG emissions intensity of the Company's gas system and allow the Company to make additional, cost-effective progress toward the Clean Heat Targets, and are thus in the public interest and properly part of just and reasonable gas utility service.

In sum, because Senate Bill 21-264 allows for—and does not prohibit—the use of emission-reduction measures beyond the enumerated Clean Heat Resources, the Commission may approve the entire Clean Heat Plus portfolio under either its authority to approve a Clean Heat Plan that best balances emission reductions and costs or its broader authority in approving just and reasonable rates.

Q. IS THERE LANGUAGE IN SENATE BILL 21-264 OR ANY OTHER PROVISIONS WITHIN TITLE 40 THAT PROHIBITS THE USE OF THE ADDITIONAL MEASURES THE COMPANY IS PROPOSING IN CLEAN HEAT PLUS?

A. No. Nothing prohibits the Commission from approving the use of emission offsets. Indeed, the Commission has approved offsets in the past. In Proceeding No. 09A-602E, the Company obtained approval to sell RECs with certain margin sharing terms, including ten percent of the margins to be directed towards funding a carbon offsets pilot.[38] The Company did so, and I co-managed the acquisition of these offsets. Similarly, nothing prohibits the Commission from encouraging approving the Company to acquire CNG where it can be credibly demonstrated that such

[38] *See* Decision No. C10-0267, in Proceeding No. 09A-602E, *as modified*, Decision No. C10-0444.

acquisition reduces emissions in the production, processing, and transportation of natural gas before the Company takes possession of it.

Q. DO YOU HAVE ANY CONCLUDING COMMENTS ON THE TOPIC OF THE COMMISSION'S AUTHORITY UNDER SENATE BILL 21-264 OR OTHERWISE?

A. The Commission has broad authority under Senate Bill 21-264 and its general regulatory authorities at its disposal to approve a portfolio like Clean Heat Plus. In considering this Clean Heat Plan, it is sound energy policy to ensure that emissions reductions opportunities are not left on the table, so to speak, due to an overly constrained reading of what Clean Heat Plans brought before the Commission may or may not include.

C. Summary of Clean Heat Plus Benefits

Q. WHY IS THE COMPANY PROPOSING THE ADDITIONAL EMISSIONS REDUCTION MEASURES IN ADDITION TO THE CLEAN HEAT RESOURCES ENUMERATED IN SB 21-264?

We propose these here for several reasons. The first is affordability. The E3 analysis presented by Mr. Daniel Aas demonstrates that the Emissions Target portfolio that establishes a pathway toward the emissions reduction target in 2030 does so at significant program cost - $1136 million over the 5-year program period. By adding the two additional emission reduction measures in Clean Heat Plus, we can provide the same level emission reductions for $816 million – a potential savings over $300 million. We find that cost savings hard to ignore. The Company wants to be open-minded and creative in this proceeding in order to find solutions that can maintain affordability while pursuing the objectives of the Clean Heat

Statute. While we look forward to the suggestions of other parties, at this time Clean Heat Plus is the portfolio that best balances affordability and emissions reduction targets and therefore our preferred option.

Q. ARE THERE OTHER REASONS YOU ARE PROPOSING CLEAN HEAT PLUS?

A. Yes. As discussed in Section VI of my testimony, we believe that designing diversity into this first CHP is important. At this stage of the gas LDC evolution, it is not clear what the best, most scalable, most affordable solutions will be to achieve emissions targets by 2030 and deeper reductions after 2030. I liken this period to where we stood 20 years ago in planning to achieve RES targets. The answers were not clear then. We were considering geothermal, biomass, and solar thermal technologies. Since then, wind and tracking solar photovoltaic generation have dominated renewable generation. While we have brought much analysis to this Proceeding, we do not have all the answers today. Under these conditions, it is prudent to advance a diverse portfolio. Clean Heat Plus does this by advancing six major emission reduction tools: electrification, efficiency, renewable natural gas, hydrogen (when a project becomes viable), CNG, and carbon offsets.

By investing in the broadest array of emission reduction measures now, we give ourselves the best opportunity to find the most cost-effective resource mix over the long term, through 2050. Pursuing all six of the measures included in Clean Heat Plus invests across six areas of the state's economy, to begin emissions reductions in the short term, but ideally to begin market transformation to create deeper, longer-term emissions reductions. Clean Heat Plus can be seen

as a market transformation engine to further Colorado's clean energy transition and statewide emission reduction efforts through a diverse portfolio of investments.

Q. IS FLEXIBILITY IN IMPLEMENTATION A KEY PART OF THE CLEAN HEAT PLUS APPROACH?

A. Yes. In Section VI of my testimony, I will describe the uncertainties and approach to manage those uncertainties that the Company has developed. I would further note that this uncertainty management approach is necessary, in my opinion, regardless of which portfolio the Commission ultimately approves.

V. HOW THE CLEAN HEAT PLAN FITS INTO OTHER PLANNING EFFORTS

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

A. This section of my testimony briefly discusses how the Clean Heat Plan fits within the broader scope of the Company's planning efforts for its gas LDC system and to decarbonize both the gas and electric sides of its business.

Q. WHAT OTHER GAS PLANNING EFFORTS ARE UNDERWAY AT THE COMPANY?

A. The Company engages in a range of planning exercises for the gas system at all levels in order to ensure reliability and safety, as well as to work toward the State's policy goals and reduce costs for our customers. The Company's internal processes translate into several review processes before the Commission, including:

- *Gas Infrastructure Plans*: The Company filed its first Gas Infrastructure Plan ("GIP") on May 18, 2023, covering the period 2023-2028. This plan covers the Company's system planning, forecasting, and investments at a high level.

- *DSM/BE Plans*: The Company's latest DSM/BE Strategic Issues proceeding is No. 22A-0309EG; the Commission issued Decision No. C23-0413 on June 22, 2023. In the Strategic Issues proceedings, the Company brings forward high-level DSM and BE plans and budgets. Plans for individual years are litigated in annual DSM plan proceedings.

- *Gas Purchasing Plans*: The Company files a Gas Purchasing Plan ("GPP") each year outlining its purchasing strategies.

- *GCA filings*: The Company updates the Gas Cost Adjustment ("GCA") on a quarterly basis consistent with the GCA tariff, and files annual Gas Purchase and Deferred Balance reports.

- *Electric Resource Planning and Clean Energy Plans*: The Company files Electric Resource Plan ("ERPs") to ensure it has sufficient resources to meet projected demand. Under Senate Bill 21-236, the Company files a Clean Energy Plan ("CEP") concurrently with an ERP, in which the

Company demonstrates its generation mix is on a pathway to achieve the State's 2030 and 2050 clean energy targets. Phase I of the Company's latest ERP and its first-ever CEP were approved in Decision Nos. C22-0459 and C22-0559 in Proceeding No. 21A-0141E. Phase II of the ERP is ongoing. Moreover, as an approved Clean Heat Plan begins to drive resource needs for our electric business, future ERP cycles will need to incorporate these resource needs.

Q. HOW DOES PLANNING UNDER THE CLEAN HEAT STATUTE INTERACT WITH THESE PROCESSES?

A. This Clean Heat Plan proceeding provides the Commission with the first comprehensive look at how the Company's gas LDC system may evolve to meet the State's decarbonization targets. The approval of a CHP will filter back into the Company's other processes, informing what infrastructure we will or will not need to build in GIPs, what gas we will purchase in GPPs (and how GPPs may need to evolve to capture other fuel purchases), and the extent of incremental DSM and BE measures we add on to our existing programs.

The Company anticipates an expansion of electrification of its gas customers' energy usage as part of our preferred Clean Heat Plus portfolio. Moreover, electrification represents a sizeable portion of the emissions reduction measures and efforts under nearly all of our presented portfolios. This new electric demand will be incorporated into forecasts for our next ERP to be filed in 2026. This new electric demand, if realized at the scale that many of the presented portfolios imply, could also create the need for additional local planning of the distribution system through internal processes and also through the Company's next Distribution System Plan.

The CHP and GIP planning processes will also inform the Company's requests for approval for specific infrastructure projects in future CPCN proceedings and into future rate cases. Together, these processes demand transparency and establish the framework for successful reduction of GHG emissions from our gas system, while also providing regulatory support for ongoing and required gas infrastructure investment.

Q. DOES THIS CLEAN HEAT PLAN ADDRESS FUTURE GAS INFRASTRUCTURE REQUIREMENTS?

A. Generally, no. Gas infrastructure planning is addressed in the Company's GIP proceedings, the first of which was filed May 18, 2023. This Clean Heat Plan does not replace that process, nor does it attempt to address the issues that the Commission has specifically assigned to GIP proceedings. This Clean Heat Plan will begin a series of fundamental changes to our gas LDC system as it moves toward a net-zero future. Those changes do not, however, eliminate the need for traditional system planning.

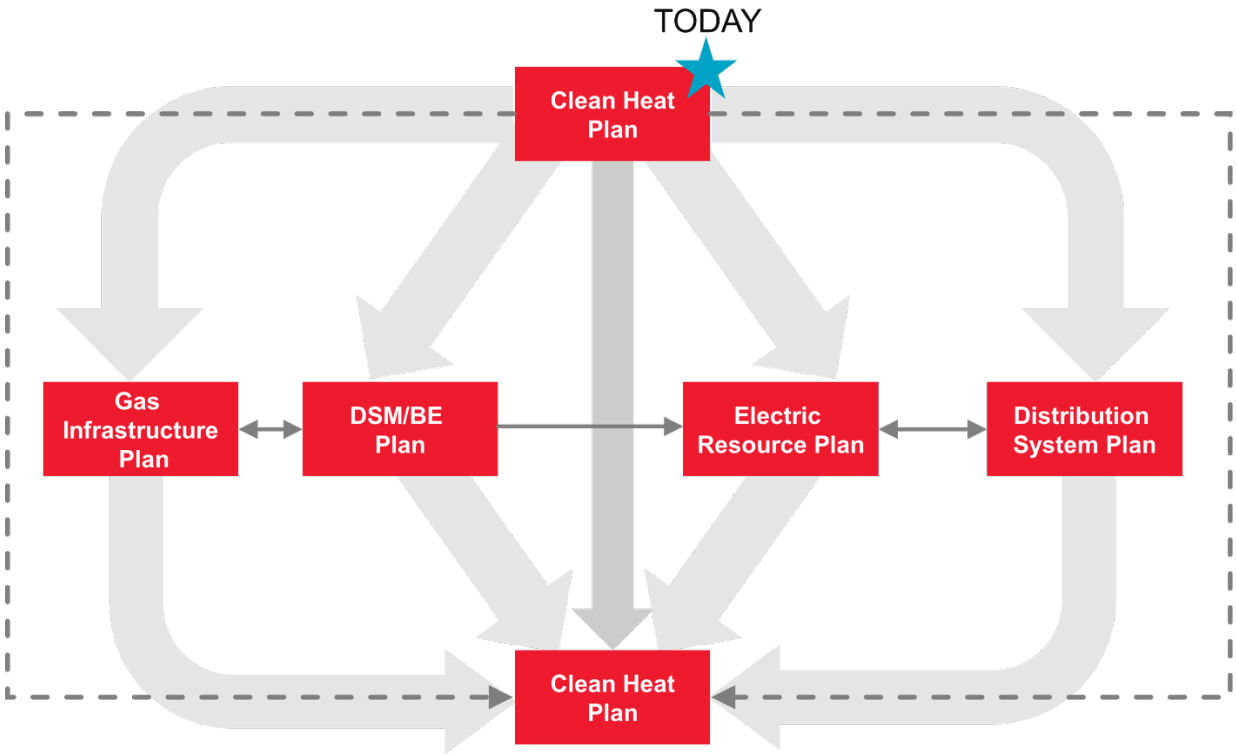
The Company is committed to delivering safe, reliable, and affordable energy to its customers, including via the gas LDC system. Under all portfolios we have modeled—indeed, under any realistic scenario—that system will still exist in 2030. Our customers will still depend on it—albeit less so as their use electrifies—and we will still need to maintain and operate it in a prudent manner. This will require system upgrades as needs arise, and we will bring those issues to the Commission in GIPs and in CPCN proceedings as necessary.

As the Company stated in its 2023-2028 Gas Infrastructure Plan, we are committed to analyzing non-pipeline alternatives ("NPAs") and other means to reduce gas infrastructure investment where feasible from an engineering perspective if it makes financial sense for our customers. The use of NPAs will reduce the risk of "stranded assets" and is aligned with our Clean Heat goals of reducing the throughput and emissions intensity of our gas system over time. To be clear, there will be times when new gas system infrastructure will be required for safety and reliability reasons, but we are committed to analyzing NPAs, including the full electrification of potential new customers. We have proposed in this plan two NPA projects in the Market Transformation Initiatives portfolio. These NPAs were introduced in the Company's inaugural GIP filing in May of 2023, and so in this way there is a degree of overlap between GIP and CHP planning filings.

Q. HAS THE COMPANY PREPARED A GRAPHIC REPRESENTATION OF THE INTERACTION OF THESE DIFFERENT PROCESSES?

A. Yes. The Clean Heat Plan process has a multi-faceted set of interactions with other processes on both the electric and gas side of the business. The figure below attempts to map out these interactions at a high level; understanding these interrelationships, in my estimation, is a foundational building block as we move forward with this first Clean Heat Plan.

Figure JWI-D-4: Key Gas Planning Regulatory Processes



VI. CLEAN HEAT PLAN IMPLEMENTATION, UNCERTAINTIES, AND FLEXIBILITY MECHANISMS

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

A. This section of my testimony discusses some of the uncertainties inherent in implementing this first-ever Clean Heat Plan. To manage these uncertainties, we propose to use a suite of flexibility mechanisms to monitor progress toward the Clean Heat Targets, report on that progress to the Commission, and adjust Clean Heat programs as necessary to better serve our customers, make more rapid progress toward our goals, refine understanding of the most cost-effective reductions, and learn and adjust along the way. I view this proposal as foundational to our Clean Heat Plan because we are in the opening stages of reducing GHG emissions from our LDC. As we have done with the electric business, we will learn as we go, with flexibility and adjustment necessary to correspond to the evolution of markets for products and product offerings themselves as we move forward.

A. Uncertainties Involved in Implementing a Clean Heat Plan

Q. WHY IS IT IMPORTANT FOR THE COMMISSION TO CONSIDER THE UNCERTAINTIES ASSOCIATED WITH IMPLEMENTING THE COMPANY'S CLEAN HEAT PLAN?

A. As with any new project, the Company cannot provide certainty that all of the moving parts involved with executing our preferred plan—or any of the modeled portfolios, for that matter—will work exactly as projected. There is a difference between a planning exercise conducted in a hearing room and the real-world

construction and operation of projects and implementation of programs across our service territory. The Commission and all parties should expect that we will learn many lessons during the implementation period about what aspects of the plan work well and what aspects present challenges that we may not be able to anticipate today. The portfolios we have modeled involve new and emerging technologies and markets, and each program the Company is proposing has inherent, unique challenges.

Q. WHAT UNCERTAINTIES ARE IMPORTANT TO CONSIDER WITH RESPECT TO DEMAND SIDE MANAGEMENT?

A. As the Commission knows, DSM programs are a complex balance of regulation, utility action, and customer behavior. The Company's modeling includes the effects of DSM, or energy efficiency, measures that the Commission has already approved and additional gas DSM measures. Together, those measures represent significant growth of the Company's DSM programs. There are uncertainties in whether we get the incentives right to spur customer action and whether customer behavior will create the level of usage reductions that is assumed in the modeling. There are also risks that some customers may reject DSM programs based on their experiences, which is particularly true for demand response programs. These uncertainties are discussed in further detail in the testimony of Company witness Mr. Mark.

Q. WHAT ABOUT THE UNCERTAINTIES FOR USING RECOVERED METHANE?

A. "Recovered methane" is defined in the Clean Heat statute to include several different types of technologies, each of which has its own challenges. Some of

these technologies are new or have not been implemented at scale in Colorado. There is uncertainty as to whether these projects will be able to meet the requirements of the recovered methane protocols that have been approved by the AQCC. It is unclear whether there will be enough viable projects within Colorado to create sufficient volumes of recovered methane for the Company to meet its projections. In addition, there is a risk that it will not be cost-effective for the Company to compete with purchasers operating under California's low-carbon fuel standard for the same molecules. These uncertainties are discussed in further detail in the testimony of Company witness Mr. Weinberg.

Q. WHAT ARE THE UNCERTAINTIES RELATED TO GREEN OR CLEAN HYDROGEN PROJECTS?

A. Production of green or clean hydrogen has not yet been accomplished at scale. While we expect the incentives in the IRA to spur the development of the hydrogen industry and the Company is advancing a hydrogen hub proposal and taking other steps to create a robust hydrogen economy to the ultimate benefit of the State of Colorado, the scale, timing, and cost of these developments is uncertain. Blending hydrogen into existing gas LDC systems creates another set of challenges, including concerns that LDCs must address in order to maintain safety and reliability. These uncertainties are discussed in further detail in the testimony of Company witnesses Mr. Jensen and Mr. Gardner.

Q. WHAT UNCERTAINTIES SHOULD THE COMMISSION CONSIDER IN RELATION TO BENEFICIAL ELECTRIFICATION?

A. As with DSM, the portfolios presented in this Clean Heat Plan contemplate electrification at a pace and scale well beyond what is currently seen on the Company's system. Prices and the availability of incentives will affect the total cost to each individual customer to purchase new electric appliances, and thus the aggregate willingness of our customer base to electrify at the rates we have modeled. Supply chain issues could affect the availability of heat pumps and qualified installers at the scale needed to meet the projections, particularly in the Emissions Target and Electrification Only scenarios. Electrification is voluntary, and customer experience with using heat pumps and contractor experience with installing them could affect the rate of uptake. These uncertainties are discussed in further detail in the testimony of Company witness Mr. Mark.

Q. WHAT ARE THE UNCERTAINTIES ASSOCIATED WITH PURCHASING CERTIFIED NATURAL GAS?

A. The market for CNG is still developing, and there are uncertainties in our projections of the volumes and price of CNG that will become available over time. The Company's ability to purchase CNG depends on the adoption of certification requirements by a sufficient number of upstream and midstream companies in the basins from which the Company is able to procure gas. Moreover, the Company may end up competing with other purchasers for those same molecules if other LDCs adopt CNG programs. These uncertainties are discussed in further detail in the testimony of Company witness Dr. Lieb.

Q. WHAT ABOUT THE UNCERTAINTIES RELATED TO THE USE OF OFFSETS?

A. The use of offsets depends on the approval of a sufficient number of projects that can meet applicable offset protocols requirements. Those projects may not develop in sufficient scale to meet the needs of the Company and other purchasers of offsets, and competition for offsets may increase their price. These uncertainties are discussed in further detail in the testimony of Company witness Mr. Weinberg.

Q. GIVEN THE UNCERTAINTIES ASSOCIATED WITH EACH OF THESE STRATEGIES, WHAT ARE YOUR TAKEAWAYS?

A. The preceding discussion is representative of the potential challenges associated with implementing each strategy in the preferred portfolio—or any portfolio for that matter. It is not intended to be comprehensive, nor have I attempted to quantify each of these uncertainties. What we do know is that the path to decarbonizing the Company's gas system is far from crystal clear. The Company expects that many of the programs and market transformation initiatives it is proposing today will be successful. Each element of Clean Heat Plus has a viable pathway to success; otherwise, we would not include them in the plan. By the same token, however, we should also expect that some of the programs will face challenges and may even fail. We cannot know today which programs will and will not be successful. These expectations apply regardless of which portfolio the Commission approves, but they reinforce one of the benefits of the Clean Heat Plus approach. By taking an all-of-the-above approach, the preferred portfolio allows the Company to attempt each of the solutions we believe is currently viable. We can then adjust our focus among those solutions as needed, doubling down

on what is working and scaling back on programs that are not cost-effective or not delivering the emission reductions we expect. That approach avoids the risks associated with putting all of our proverbial eggs in one basket, which would compound the potential downsides of the technical, behavioral, and cost uncertainties I have described in this section.

B. Flexibility Mechanisms

Q. GIVEN THE UNCERTAINTIES YOU JUST DESCRIBED, WHAT IS THE COMPANY PROPOSING IN TERMS OF FLEXIBILITY TO IMPLEMENT ITS CLEAN HEAT PLAN?

A. The Company is proposing a framework we refer to as "Plan Do Check Act."[39] The goals of that framework are to give the Company the ability to react to the lessons we learn as we move into the implementation period, and to keep the Commission and stakeholders informed about the Company's progress. The proposal builds on mechanisms that the Commission, Company, and stakeholders have used successfully in other contexts.

Q. WHAT SPECIFIC MECHANISMS IS THE COMPANY PROPOSING?

A. First, the Company will file the Clean Heat Plan Annual Reports required by Rule 4733. In addition to the required reporting, the Company proposes that the Commission schedule a Commissioners' Information Meeting ("CIM") 45 to 60 days after the submission of each Annual Report to allow for dialogue around the contents of the report. Given the uncertainties, challenges, and importance of

[39] "Plan Do Check Act" is a common summary phrasing of a business process to iterate design, management, and implementation of products and services. We borrow the phrase here as it applies well to whichever portfolio the Commission ultimately approves in this Clean Heat Plan.

data as we embark on the evolution of our LDC, the opportunity for public discussion and feedback is imperative to success.

Second, the Company is proposing a program adjustment mechanism with a 60/90-Day Notice process like that used in the Company's Transportation Electrification Plan ("TEP") and DSM programs. The Company and stakeholders have successfully used this mechanism in other contexts, and we believe it will create efficiencies for adding, modifying, or discontinuing programs within the approved Clean Heat Plan.

Third, the Company requests approval of budget flexibility similar to that approved in the Company's 2021 TEP and refined in its 2023 TEP application. That flexibility will allow the Company to deploy capital toward the programs that are the most-cost-effective as technologies and markets develop.

Q. PLEASE DESCRIBE THE COMPANY'S PROPOSAL TO SCHEDULE COMMISSIONERS' INFORMATION MEETINGS IN CONJUNCTION WITH ITS ANNUAL REPORTING.

A. The Company expects to learn a significant amount of information about each element of the Clean Heat Plus portfolio, or the portfolio approved by the Commission, as implementation begins. Rule 4733 requires the Company to report expenditures, emissions, emission reductions, updated forecasts, and other information to the Commission on an annual basis. Included in those reports will be information on each of the categories of clean heat resources as well as the additional emission reduction mechanisms proposed (if the Clean Heat Plus portfolio is approved by the Commission). Because these reports will include

information that is new to the Commission and that may be useful for refining the Company's approach to implementing its plan, the Company proposes to schedule a CIM 45-60 days after each Annual Report. Those meetings will provide a regular, live opportunity for the Commission to ask questions regarding the Annual Report and provide appropriate feedback for the Company's consideration.

Q. TURNING TO THE PROGRAM ADJUSTMENT MECHANISM, CAN YOU DESCRIBE THE 60/90-DAY NOTICE PROCESS THE COMPANY IS PROPOSING IN THIS PROCEEDING?

A. As background, the Commission approved a 60/90-Day Notice process in the 2021 TEP proceeding that was similar to the process used for the Company's Demand Side Management programs. I mention the TEP particularly as it is a recent implementation of this process that covers a new, multi-program initiative. That description also applies to the CHP. However, the 60/90-Day Notice process is also well-established in the Company's implementation of DSM Plans.

The 60-Day Notice Process allows the Company to undertake efficient changes to its TEP portfolios, introduce programs, and make needed adjustments. The 90-Day Notice Process governs proposals to discontinue a program or product offering.

Through the 60-Day Notice Process, the Company will issue a notice to stakeholders who then have 30 days to provide comments to the Company. After the initial 30 days, the Company then has 30 days to consider the comments and respond to them accordingly. The Company then files a summary report in the appropriate proceeding that summarizes the comments received and why they

were incorporated into the final notice or justification of why comments were not incorporated.

For a 90-Day Notice, the process is relatively similar. Stakeholders have 30 days to provide comments, and then the Company has 60 days to consider the comments before the Company makes a final decision on the proposed discontinuance.

Q. IS THE COMPANY PROPOSING THE SAME 60/90-DAY NOTICE PROCESS FOR IMPLEMENTING THE CLEAN HEAT PLAN, AND IF SO, WHY?

A. A similar process. In the DSM and TEP contexts, the Company has found the process to be very helpful to establish processes for new offerings, to introduce new pilot projects, and to make adjustments to program offerings as needed with changing market conditions. The Company proposes to use the same general process for implementing its Clean Heat Plan. For Clean Heat, the Company proposes to remove the "notice of deficiency" procedure used in the TEP. That procedure has not been used to date for the TEP and creates potential complications and delays from a program implementation perspective. It is also unnecessary, as Staff and other stakeholders may file appropriate pleadings with the Commission raising any concerns that are not resolved through the stakeholder process.

The 60/90-Day Notice process will allow the Company the flexibility to make changes to its Clean Heat programs with stakeholder input, provide proper bounds, and help create regulatory efficiencies by avoiding the need for a fully litigated proceeding that causes unnecessary litigation costs to customers, the Company,

and intervenors alike. The process is an efficient and transparent mechanism, familiar to and tested by stakeholders, with proper checks that allow for adjustments in a timely manner. It has been the Company's experience in the TEP and DSM contexts that the preview of contemplated notices to stakeholders and receiving initial feedback has helped to inform Company proposals and has helped to construct more insightful notices based upon that initial feedback. The 30-day comment period for stakeholders to provide feedback has also helped to further refine proposed changes and improve offerings.

The 60/90-Day Notice process has a successful track record and meets the need in this Clean Heat Plan proceeding to allow for timely modifications to the Company's programs with stakeholder input.

Q. WHAT IS THE COMPANY'S PROPOSAL FOR BUDGET FLEXIBILITY?

A. The Company proposes the same budget flexibility mechanism it is proposing in its 2023 TEP application, in Proceeding No. 23A-0242E, which in turn are quite similar to the budget flexibility mechanisms approved by the Commission in the 2020 TEP application, in Proceeding No. 20A-0204E. Specifically, the Company requests the Commission approve flexibility to move dollars between approved mechanisms within the preferred Clean Heat Plus portfolio (e.g., Beneficial Electrification, Gas DSM, RNG, Hydrogen, CNG, and Offsets), subject to a cap of 150 percent; flexibility to move the overall five-year budget between years; and flexibility for the overall budget across the five-year Clean Heat action plan period subject to a cap of 125 percent.

Flexibility in the Company's budget across plan mechanisms and time will allow the Company to respond to changes in emerging markets, the relative cost-effectiveness of various new technologies, and customer needs as we implement the Clean Heat Plan. As the Company's experience in implementing its first TEP has shown, this flexibility will avoid the unintended consequence of limiting funding for certain programs due to timing constraints and allow projects that face an obstacle in one year to move forward in the next. The flexibilities described here will also allow the Company to make maximum progress on emissions reduction without burdening the Commission with additional and unneeded procedural tasks, promoting regulatory efficiency. Given the significant uncertainties regarding the available volumes of molecules and pace of deployment of technologies, budget flexibility is necessary for the Company to adapt its programming as conditions evolve without the need for additional litigation.

Q. PLEASE SUMMARIZE THE COMPANY'S REQUESTS THAT YOU HAVE DESCRIBED IN THIS SECTION OF YOUR TESTIMONY.

A. The Company recommends that the Commission approve the following:

- The Company's proposal to schedule a CIM 45 to 60 days after the filing of its Clean Heat Plan Annual Reports under Rule 4733;
- A 60/90-Day Notice process for adding, modifying, or discontinuing programs in the approved Clean Heat Plan; and
- The Company's budget flexibility proposal.

Q. WHAT IS THE PROPOSED TIMING OF THE COMPANY'S NEXT CLEAN HEAT PLAN?

A. This is a good question to consider in a conversation concerning flexibility mechanisms, because the next plan is the most comprehensive flexibility tool available to evolve the gas LDC clean energy transition beyond this inaugural plan. All of the feedback mechanisms described above will inform the development of the next plan. At this time, the Company recommends and currently anticipates the filing of the Company's next CHP in four years (2027), in order to balance the insights developed from implementation of this plan with the need to refine the CHP efforts toward the 2030 target. The Company plans to revisit this question in its annual reports to the Commission.

VII. REGULATORY REQUIREMENTS

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

A. This section of my testimony discusses the requirements under Senate Bill 21-264 and Commission Rules for the submission of a Clean Heat Plan, and how the Company's plan and preferred portfolio comply with those requirements.

Q. IS THE COMPANY'S PREFERRED CLEAN HEAT PLUS PORTFOLIO ALIGNED WITH THE STATUTORY CONSIDERATIONS OF SB21-264 AND THE COMMISSION'S RULES?

A. Yes. I am not an attorney, and the Company's Statement of Position can address issues of statutory compliance. However, from my perspective, the aggressive, all-of-the-above approach in the Clean Heat Plus portfolio aligns with the requirements of Senate Bill 21-264, and it is the portfolio that best balances the considerations of emission reductions, benefits, prioritizing IQ and DI customers, costs, and system reliability as the statute and Commission Rules require. In this section, I provide a non-exhaustive table highlighting key places where the Company's direct testimony addresses the statutory and rule requirements. I will then provide a high-level discussion of why the Clean Heat Plus portfolio both meets the statutory requirements and should be approved under the public interest standard of review that the Commission must use in this proceeding.

Q. PLEASE DESCRIBE THE PLACES WHERE THE COMPANY'S DIRECT TESTIMONY ADDRESSES THE REQUIREMENTS FOR A CLEAN HEAT PLAN IN SB21-264 AND THE COMMISSION'S RULES.

A. Table JWI-D-4 below indicates key places in the Company's direct testimony where we address the requirements of SB 21-264 and Rules 4725-4733. This table is not meant to be exhaustive, as some requirements are addressed in multiple places. The Company's testimony as a whole supports the Clean Heat Plan and the preferred portfolio.

Table JWI-D-4: Statutory and Rule Requirements

Statutory Provision / Rule	Requirement	Key Direct Testimony Sources
(4)(c)(I)*	Clean Heat targets	Direct Testimonies of Mr. Ihle, Mr. Aas, Ms. Quillian and Clean Heat Plan.
(4)(c)(II)	Present portfolios and preferred option	Direct Testimony of Mr. Ihle, Sections III and IV, and Clean Heat Plan
(4)(c)(III)	GHG emission reductions	Direct Testimonies of Ms. Quillian and Mr. Aas, and Clean Heat Plan
(4)(c)(IV)	Program budgets	Direct Testimony of Mr. Ihle, Section IX, and Clean Heat Plan, and Clean Heat Plan
(4)(c)(V)	Investments for DI/IQ customers	Direct Testimony of Mr. Ihle, Sections VIII and X, and Clean Heat Plan
(4)(c)(VI)	Projections through 2050	Direct Testimony of Ms. Quillian

(4)(c)(VII)	Consistency with recovered methane protocol rules	Direct Testimonies of Mr. Weinberg and Ms. Quillian
(4)(c)(VIII)	Additional air quality, environmental, and health benefits	Direct Testimonies of Mr. Ihle and Mr. Aas
(4)(c)(IX)	New customer and system growth forecasts	Direct Testimony of Mr. Goodenough
(4)(c)(X)	Safety, reliability, and resilience of the Company's gas service	Direct Testimony of Mr. Gardner
(4)(c)(XI)	Cost of preferred portfolio	Direct Testimony of Mr. Ihle, Section IX, and Clean Heat Plan
(4)(c)(XII)	Cost recovery	Direct Testimony of Mr. Ihle, Section IX, and Clean Heat Plan
(4)(c)(XIII)	Analysis of costs and benefits, including social cost of carbon and social cost of methane	Direct Testimonies of Mr. Ihle, Mr. Aas, and Ms. Quillian
(4)(c)(XIV)	Monitoring and verification methodology for annual reporting	Direct Testimonies of Mr. Ihle and Ms. Quillian
Rule 4731(a)	Initial forecasts	Direct Testimony of Mr. Goodenough, and Clean Heat Plan
Rule 4731(b)	Portfolios	Direct Testimonies of Mr. Ihle and Mr. Aas
Rule 4731(c)	Portfolio forecasts	Direct Testimonies of Mr. Ihle, Mr. Aas, and Ms. Quillian
Rule 4731(d)	Components of each portfolio	Direct Testimonies of Mr. Ihle and Mr. Aas

Rule 4731(e)	Green hydrogen	Direct Testimonies of Mr. Jensen and Mr. Gardner
Rule 4731(f)	Project-based information	Direct Testimonies of Mr. Ihle, Dr. Lieb, Mr. Weinberg, and Mr. Jensen
Rule 4731(g)	Cost-recovery proposals	Direct Testimony of Mr. Ihle, Section IX, and Clean Heat Plan
(6)(c)-(d); Rule 4732	Approval factors	Direct Testimony of Mr. Ihle, Sections IV and VII

* Statutory references are to § 40-3.2-108, C.R.S.

Q. WHAT PORTFOLIOS DOES SENATE BILL 21-264 REQUIRE AN APPLICANT TO PRESENT?

A. A gas utility must present two portfolios in a Clean Heat Plan application. First, the utility must present "[a] portfolio of resources that uses clean heat resources to the maximum practicable extent, that complies with the cost cap, that may include leak reductions approved by the commission, and that may or may not meet the clean heat target in the applicable plan period but that demonstrates reductions in methane emissions."[40] The Company's Cost Target portfolio fulfills these requirements. Second, the utility must present "[a] portfolio that meets the clean heat targets in the applicable plan period using only clean heat resources but that

[40] § 40-3.2-108(4)(c)(II)(A), C.R.S.

need not meet the cost cap."[41] The Company's "Emissions Target" portfolio fulfills these requirements.

Q. DOES A UTILITY FILING A CLEAN HEAT PLAN HAVE FLEXIBILITY TO PRESENT ADDITIONAL PORTFOLIOS?

A. Yes, at its discretion, the applicant may include other portfolios of resources.[42] The utility must also select its preferred option from the portfolios presented.[43] The goal of presenting the required portfolios and any additional portfolios is for the utility "to demonstrate alternative compliance approaches for reducing carbon dioxide and methane emissions to meet the clean heat target in the applicable plan period."[44] Compliance with the applicable clean heat target is demonstrated if the utility "utilize clean heat resources to the maximum extent practicable."[45] The Company presents two additional portfolios, Electrification Only and Clean Heat Plus.

Q. WHAT FACTORS DOES SENATE BILL 21-264 DIRECT THE COMMISSION TO CONSIDER AS IT EVALUATES A CLEAN HEAT PLAN?

A. The statute directs the Commission to approve a Clean Heat Plan if it is in the public interest, taking into account the following factors in § 40-3.2-108(6)(d)(I)(A)-(E), C.R.S.:

(A) Whether the clean heat plan achieves the clean heat targets through maximizing the use of clean heat resources;

[41] § 40-3.2-108(4)(c)(II)(B), C.R.S.
[42] § 40-3.2-108(4)(c)(II)(C), C.R.S.
[43] § 40-3.2-108(4)(c)(II), C.R.S.
[44] § 40-3.2-108(4)(c)(II), C.R.S.
[45] § 40-3.2-108(4)(d)(I), C.R.S.

(B) The additional air quality, environmental, and health benefits of the plan in addition to the greenhouse gas emission reductions;

(C) Whether investments in a clean heat plan prioritize serving customers participating in income-qualified programs and communities historically impacted by air pollution and other energy-related pollution;

(D) Whether the clean heat plan results in a reasonable cost to customers, including savings to customer bills resulting from investments made pursuant to the plan; and

(E) Whether the clean heat plan ensures system reliability.

In addition, Rule 4732 requires the Commission to consider, among other things, whether the plan "can be implemented at the lowest reasonable cost and rate impact," whether the plan "presents risks to the utility's customers, including the risk of market volatility and the risk of stranded investment costs," and whether the plan "provides long-term impacts on Colorado's utility workforce as part of a just transition."

Q. DO THE COMMISSION'S RULES PROVIDE ANY ADDITIONAL GUIDANCE AS TO HOW A UTILITY SHOULD OPTIMIZE ITS CLEAN HEAT PLAN?

A. Yes. In Rule 4731(b)(I)(E), the Commission directs each utility submitting a Clean Heat Plan to identify a preferred portfolio that "best balances" maintaining just and reasonable rates, maintaining system safety, reliability and integrity, protecting disproportionately impacted communities, labor standards, and contributing to progress on meeting the statewide GHG emission reduction goals in HB19-1261 and the Clean Heat targets.

Q. BEGINNING WITH THE STATUTORY FACTORS, DOES THE COMPANY'S CLEAN HEAT PLUS PORTFOLIO "ACHIEVE THE CLEAN HEAT TARGETS THROUGH MAXIMIZING THE USE OF CLEAN HEAT RESOURCES"?

A. Yes, to the maximum extent practicable. When determining whether to approve a Clean Heat Plan, the Clean Heat statute requires the Commission to consider

"[w]hether the clean heat plan achieves the clean heat targets through maximizing the use of clean heat resources" as one of several balancing factors.[46] Similarly, the Commission's Rules require it to consider "whether the plan achieves the clean heat targets using clean heat resources that, in aggregate, maximize greenhouse gas emission reductions," again as one of several balancing factors."[47] The statute and rules also require the Commission to consider, among other things, the costs of the plan. While I am not an attorney, this language makes achieving the Clean Heat Targets one important factor—but not the only factor—for the Commission to consider. The Clean Heat statute also states that a gas distribution utility demonstrates compliance with the statutory targets if it "utilize[s] clean heat resources to the maximum extent practicable."[48] That requirement demonstrates the General Assembly's understanding that utilities must make best efforts to achieve the Clean Heat Targets, but that a demonstration of achievement is not mandatory if the targets are not practicable to achieve. The Company has embraced the goal of reaching these targets, but it is important to level set for this and future Clean Heat proceedings that decarbonizing gas LDC systems will involve new technologies and that some emission reduction measures may prove technically infeasible or cost prohibitive.

As described above in Section IV of my testimony, the Clean Heat Plus portfolio puts the Company on track to achieve the 2030 Clean Heat Target. It

[46] § 40-3.2-108(6)(d)(I)(A), C.R.S.; *see also id.* § 40-3.2-108(6)(c)(II) ("In evaluating a clean heat plan, the commission shall consider whether the plan will achieve the applicable clean heat targets.").
[47] Rule 4732(b)(I).
[48] § 40-3.2-108(4)(d), C.R.S.

also makes the maximum practicable progress toward the 2025 Clean Heat Target using clean heat resources given the tools available for deployment over the next 2 years.

The Clean Heat Plus portfolio is projected to result in approximately 600,000 CO_2 equivalent tons of emission reductions, which reaches 55 percent of the targeted reductions in 2025. Of that 600,000 tons, 395,000 tons are expected to come from Clean Heat Resources. It does so by spending $180 million on Clean Heat resources cumulatively through 2025. By comparison, the Cost Target Portfolio achieves only 176,000. The Emissions Target portfolio, which relies entirely on enumerated Clean Heat Resources as compared to the Clean Heat Plus portfolio, demonstrates that the 2025 Clean Heat Target is not achievable by 2025.

The Clean Heat Plus Plan improves upon the Emissions Target portfolio by attaining additional emission reductions through the use of offsets and LDC methane abatement, again at levels that are cost-effective and in the public interest. The selection of those measures, in combination with the enumerated Clean Heat Resources, represents the most cost-effective path forward to reach the 2030 Clean Heat Target.

In summary, the Clean Heat Plus portfolio "utilize[s] clean heat resources to the maximum extent practicable,"[49] thereby fulfilling the requirements of the Clean Heat statute. And the Clean Heat Plus portfolio adds onto that maximized

[49] § 40-3.2-108(4)(d), C.R.S.

amount of Clean Heat Resources by adding additional measures that achieve further emissions reduction in a cost-effective manner, further contributing to the statewide emission reduction goals most recently set by SB 23-016.

Q. DOES THE CLEAN HEAT PLUS PORTFOLIO CREATE "ADDITIONAL AIR QUALITY, ENVIRONMENTAL, AND HEALTH BENEFITS?"

A. Yes. To the extent that beneficial electrification programs in the portfolio will improve indoor air quality and result in associated health benefits, the Clean Heat Plus portfolio replaces approximately 90,000 gas furnace appliances with heat pumps. Also, in general, the volumetric natural gas reduction achieved through Clean Heat Plus (15,300,000 Dth per year in 2028) could have some degree of associated reduction in methane leakage from the Company's LDC system, though we have not calculated this effect. The Company's proposed Advanced Methane Leak Detection Initiative proposed in the Market Transformation Portfolio is aimed to reduce methane leakage on the Company's LDC system.

Q. DO THE INVESTMENTS IN THE CLEAN HEAT PLUS PORTFOLIO "PRIORITIZE SERVING CUSTOMERS PARTICIPATING IN INCOME-QUALIFIED PROGRAMS AND COMMUNITIES HISTORICALLY IMPACTED BY AIR POLLUTION AND OTHER ENERGY-RELATED POLLUTION?"

A. Yes. Section X focuses on how the Clean Heat Plus portfolio aims to serve customers participating in income-qualified programs and who live in disproportionately-impacted communities. Additionally, the residential retrofit program proposed as a Market Transformation Initiative and supported by the Colorado Energy Office, Energy Outreach Colorado, the City and County of

Denver, and the Company, will provide benefits to income qualified customers and disproportionately impacted communities by seeking to incentivize electrification without increasing energy burden for these customers.

Q. DOES THE CLEAN HEAT PLUS PORTFOLIO "RESULT IN A REASONABLE COST TO CUSTOMERS?"

A. Yes. The Company presents overall budgets and rate impacts in Section IX of my Direct Testimony. As explained further below in Section IX, the rate impacts from the Clean Heat Plus portfolio compare favorably to the Emissions Target and Electrification Only portfolios.

The Commission has the authority to approve the portion of the budget for a Clean Heat Plan that exceeds the 2.5 percent cost cap if the costs are reasonable and the plan is in the public interest,[50] and the Company requests the Commission do so for the Clean Heat Plus portfolio. As the Company's modeling shows, investments beyond the 2.5 percent cost target are necessary for the Company's emissions reductions to remain on pace to meet the Clean Heat Targets. If the Commission were to approve a lower spending level for the 2024-2028 action period, it would likely result in substantially higher costs in the next planning period if the Commission requires the Company to meet the 2030 Clean Heat Target. The Clean Heat Plus portfolio is projected to result in substantial emissions reductions while keeping costs below those in the Emissions Target and

[50] "The commission may approve, or amend and approve, a clean heat plan with costs greater than the cost cap only if it finds that the plan is in the public interest, costs to customers are reasonable, the plan includes mitigation of rate increases for income-qualified customers, and the benefits of the plan, including the social costs of methane and carbon dioxide, exceed the costs." § 40-3.2-108(6)(d)(III)

Electrification Only portfolios. Further, the DSM and BE measures will reduce gas volume usage for our customers, including during the peak winter heating season, which will reduce customer exposure to natural gas prices. The costs of the Clean Heat Plus portfolio are thus reasonable.

Q. DOES THE CLEAN HEAT PLUS PORTFOLIO "ENSURE SYSTEM RELIABILITY?"

A. Yes. The projects discussed in the Company's Gas Infrastructure Plan ("GIP"), filed in Proceeding No. 23M-0234G, will ensure the safety and reliability of our system. The Clean Heat Plus portfolio is fully consistent with the GIP. The all-of-the-above approach proposed in the portfolio will give the Company experience in bringing multiple new technologies onto the system, without the need to make radical changes or take any actions that could create risks to safety and reliability. Maintaining a safe and reliable system for our customers is the Company's top priorities, and we will make changes as needed through the proposed adjustment mechanisms to address any reliability concerns that might arise during the implementation of the plan.

Q. TURNING TO THE FACTORS UNDER RULE 4732 NOT ALREADY DISCUSSED ABOVE, CAN THE CLEAN HEAT PLUS PLAN "BE IMPLEMENTED AT THE LOWEST REASONABLE COST AND RATE IMPACT?"

A. Yes. As discussed earlier in this section, the costs of the Clean Heat Plus portfolio are reasonable. The Company's model developed by E3 selects for the lowest-cost solution given the tools available in each scenario. The Clean Heat Plus portfolio reduces costs compared to the Emissions Target Portfolio by adding

CNG, offsets, and LDC methane abatement. It is the lowest-cost portfolio that is projected to meet the 2030 Clean Heat Target. It also has the lowest costs of any portfolio, with the exception of the Cost Target Portfolio, which does not come close to the emissions abatement needed to meet either the 2025 or 2030 Clean Heat Targets.

Q. PLEASE DISCUSS WHETHER THE CLEAN HEAT PLUS PORTFOLIO "PRESENTS RISKS TO THE UTILITY'S CUSTOMERS, INCLUDING THE RISK OF MARKET VOLATILITY AND THE RISK OF STRANDED INVESTMENT COSTS."

A. Any path forward to a Clean Heat future, including a path of inaction, presents some risks relating to bill impacts. The Clean Heat Plus portfolio would reduce the risks to customers in several ways. The DSM and BE measures will allow our customers to reduce their natural gas usage through electrification and efficiency measures. This will reduce customer exposure to natural gas prices, including market volatility during the peak winter heating season. The reduced throughput contemplated by the Clean Heat Plus portfolio, if approved, can work in conjunction with fuel price management plans that will be filed under recently enacted Senate Bill 23-291 to mitigate customer exposure to fuel price volatility. It will not fully provide protections from volatility, but that is an impossible standard and not one reflected in the Commission Rules. The Clean Heat Plus portfolio, assuming adoption of DSM and BE can meet the levels projected in the modeling in support of the portfolio, builds on the electrification push that has already begun through DSM SI and does so at a sizeable magnitude and brings with it reduced exposure

to market volatility. Finally, reducing the overall throughput on the system can help reduce the need for certain infrastructure projects, which may reduce the risk of stranded investment costs in some scenarios. We expect this be an ongoing discussion as this Clean Heat Plan is evaluated and future Clean Heat Plans and Gas Infrastructure Plans are filed. For the near-term, however, Clean Heat Plus uses a diverse set of emissions reduction tools and allows for an expansion of electrification that the State has not seen to date. This brings with it another set of challenges in terms of building out the electric system to meet this new demand, requiring distribution, generation, and transmission investments to accommodate new loads. As we go forward, we need to evaluate infrastructure risks on both sides, i.e., stranded assets on the gas system and the ability to build in time on the electric system. The Clean Heat Plus portfolio finds that balance as we continue that dialogue with the Commission and stakeholders in future plans.

There is one final point to make that does not fit directly within the rule. It is simple and it is this: Clean Heat Plus manages risks to customers by taking an all-of-the above approach, based on the knowledge we have today, that maximizes our chances of having multiple new technologies achieve scale. That foundation is the foundation we need as we begin our Clean Heat journey, and it allows us to move forward with and evaluate how technologies mature to inform future Clean Heat Plans. This benefit represents, in an indirect manner, one of the key ways in which the Clean Heat Plus portfolio manages risks.

Q. PLEASE DISCUSS HOW THE CLEAN HEAT PLUS PORTFOLIO "PROVIDES LONG-TERM IMPACTS ON COLORADO'S UTILITY WORKFORCE AS PART OF A JUST TRANSITION."

A. The Clean Heat Plus portfolio contemplates jobs for Company employees and third-party suppliers and contractors to install, maintain, and operate the various technologies we intend to deploy. This factor is discussed further in Section XI of my testimony.

Q. TAKING ALL OF THE STATUTORY AND RULE FACTORS TOGETHER, IS THE CLEAN HEAT PLUS PORTFOLIO THE PORTFOLIO THAT BEST BALANCES THE COMMISSION'S GOALS IN RULE 4731(B)(I)(E)?

A. Yes. As I discuss in Section IV of my testimony, the Clean Heat Plus portfolio is the portfolio that strikes the best balance for our customers across all of the factors and criteria in the Rules and in Senate Bill 21-264. It drives emissions reductions in a cost-effective manner using a broad suite of measures, resulting in lower costs to customers than any of the other portfolios that are on track to meet the 2030 Clean Heat Target, while also making the greatest practicable progress toward the 2025 Clean Heat Target of any of the portfolios that are grounded in realistic assumptions. When compared to the other portfolios, in particular the Cost Target and Emissions Target Portfolios required by statute, the Clean Heat Plus plan is superior. It makes the greatest practicable progress toward reducing GHG emissions from our gas LDC system at a reasonable cost to our customers, and meets each of the criteria in Senate Bill 21-264 and Commission Rules.

VIII. MARKET TRANSFORMATION PORTFOLIO

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

A. This section of my testimony discusses the Market Transformation Portfolio the Company is proposing as part of any approved Clean Heat portfolio in this proceeding. Regardless of what portfolio is selected, we know that achieving ambitious emissions reductions from our gas customers is going to take significant innovation across a variety of emissions reduction efforts as well as a new level of partnership and stakeholder engagement. The Market Transformation Portfolio is designed to stimulate markets for emissions reductions tools and complement the approaches in any of our Clean Heat portfolios. Accordingly, alongside several partners, we have developed a set of initiatives and innovative fund concepts (concepts) to advance our understanding of proposed emissions reduction options. These initiatives are designed to be scalable demonstration projects that align with Colorado's and Xcel Energy's emissions reduction goals.

Q. HOW WERE THESE INITIATIVES AND CONCEPTS DEVELOPED?

A. The development of this Portfolio was a collaborative effort developed through months of discussions between the Company and key organizations with interest and expertise in the various initiatives contemplated in the Portfolio. These organizations include the Rocky Mountain Institute, Colorado Energy Office, Energy Outreach Colorado, the Southern Ute Indian Tribe, City and County of Denver, City and County of Boulder, the Colorado School of Mines, and Williams, and also large customers including Denver International Airport and Ball Arena. It is also reflective of a broader point, which is that the evolution of the LDC will be a

team effort, and we do not have all the answers. We have worked with these organizations to develop this portfolio of initiatives and concepts to gain valuable information about the market, customer adoption, and scalability of all the emissions reduction efforts that will be needed to successfully meet the state's reduction targets. With this being the very first Clean Heat Plan, none of the emissions reduction measures under consideration have been adopted or implemented at scale, leaving many unknowns about the market. In addition to selecting a 2030 portfolio, we believe it is important to get started on initiatives and concepts that not only have the potential to achieve emissions reductions for our customers today, but also bring along key partners that will be needed to execute on this long-term trajectory. We seek to collaboratively develop and use a portfolio of initiatives and concepts to gain valuable information about how to decrease market barriers and scale our emissions reductions efforts over time. Given how early we are in the journey to reduce emissions for natural gas customers, the proposed Market Transformation Portfolio is intended to gain early insights into how to transform the market to gain emissions reductions at the scale needed to achieve the Clean Heat Targets. These are not one-off pilots, but instead demonstration projects we can use to understand and overcome market barriers, assess business model requirements, increase cost-effectiveness, decrease uncertainties, and ultimately replicate and scale the emissions reduction measures required to meet the 2030 Clean Heat Target.

Q. ARE THERE OTHER ENTITIES THE COMPANY IS PLANNING TO COLLABORATE WITH ON ITS MARKET TRANSFORMATION PORTFOLIO IMPLEMENTATION IN ADDITION TO THE PARTNERS DESCRIBED ABOVE?

A. Yes. As a key example, the Company has a long history of collaborating with the DOE's National Renewable Energy Lab ("NREL") to study new technologies to enable our clean energy goals. Prior to filing this Clean Heat Plan, the Company engaged NREL on certain Market Transformation Initiatives related to electrification to which we received a strong interest in continued engagement and participation. For example, the Company plans to continue to solicit NREL's building technologies expertise as we design, implement, and evaluate our residential new build and neighborhood retrofit Initiatives discussed below.

Q. WHAT IS THE "MARKET TRANSFORMATION PORTFOLIO" COMPOSED OF?

A. The Market Transformation Portfolio is both a set of eight stand-alone projects ("Initiatives") and an Innovation Fund ("Fund") to develop and execute a suite of project concepts ("Concepts"). The portfolio presented here has been have been developed as part of this Clean Heat Plan, in coordination with several key partners and stakeholders. Further, the Fund also offers the opportunity to work with additional partners and develop new ideas for researching and deploying emerging technologies. As described in more detail below, the Initiatives are proposed as stand-alone individual projects and, in most cases, have an early partner signed on for design and execution, if approved by the Commission. The Concepts are proposed under an Innovation Fund, allowing for further development, upon approval of the Fund. Each Initiative or Concept provides a pathway to gather key

information about the challenges and opportunities to achieving emissions reductions for the gas system and customers spur market innovation and create models for future collaboration. The Company is proposing a Market Transformation Portfolio that can assess opportunities across each emission reduction measure included in the Clean Heat Plus—the Portfolio supports the overall strategy of investing in a diverse set of emission reduction options.

Q. IS THE MARKET TRANSFORMATION PORTFOLIO REQUIRED UNDER THE CLEAN HEAT STATUTE?

A. The Clean Heat statute does not explicitly require a portfolio of projects such as this. Rather, we are offering an innovative approach to getting started towards the Clean Heat Targets and deploying the eligible measures and emissions reductions required under the statute. Importantly, many of the collaborative partners, whom the Company has established working partnerships with, also recognize that these Initiatives and Concepts are important to achieving the scale and innovation that will be necessary to drive further emissions reductions.[51]

Q. PLEASE DESCRIBE THE GUIDING PRINCIPLES OF THE MARKET TRANSFORMATION PORTFOLIO.

A. At the highest level, the guiding principle of this Portfolio is to advance Initiatives and Concepts that can give us information on how to scale emissions reductions for our natural gas customers in partnership with key stakeholders. More specifically, the principles are to:

[51] The Company has included as Attachment JWI-3 signed Memoranda of Understanding with several key partners, including the Rocky Mountain Institute, Colorado Energy Office, City and County of Denver, City and County of Boulder, and Williams Energy.

- Reduce annual and cumulative greenhouse gas emissions
- Reduce natural gas demand, and potentially natural gas infrastructure investment
- Overcome barriers to market adoptions of technologies or business models
- Minimize costs and keep customer bills low
- Enhance the customer experience and customer choice
- Ensure equitable distribution of Clean Heat programs to communities across Colorado

Rather than a series of pilots, we have selected Initiatives and Concepts that can be used to study and understand the broader market impact and understand what can deliver scale. We know that a gas utility alone cannot solve the challenge before us—strategic partnerships will be key to success of this portfolio and the plan overall.

These principles are used to help guide decisions and we will integrate them into future decisions on which concepts to pursue under the Fund, but we do not expect that every Initiative or Concept will hit every principle, but the Portfolio as a whole is intended to address them.

Q. HOW WILL THE COMPANY, PARTNERS, AND STAKEHOLDERS CONTINUE TO DEVELOP THE CONCEPTS PROPOSED UNDER THE MARKET INNOVATION FUND?

A. The Company, in close collaboration with partners, customers and other stakeholders, intends to seek to develop Market Transformation Concepts into more specific projects and bring those projects forward at a later date through the 60/90 day process. As I describe in the above Section VI on flexibility mechanisms, the 60-Day Notice Process can be used as proposed in this Clean Heat Plan to

make changes to the programs, introduce programs, and make needed adjustments through a 30-day comment, 60-day response period.

Q. IS THERE PRECEDENT FOR SIMILAR TYPES OF INNOVATION CONCEPT FUNDING?

A. Yes, the Partnerships, Research, and Innovative ("PRI") portfolio in the Company's first TEP was proposed to increase and broaden access to electricity as a transportation fuel, minimize system costs and increase benefits of electric transportation, and inform future TEP modifications. The PRI set aside $10 million in funding with conceptual ideas to advance the Company's and Colorado's state of knowledge across a variety of TEP-focused topics. The PRI, with significant stakeholder input and implemented through the 60-day process, initiated seven innovative projects addressing promoting EV adoption and equity, making EV charging accessible, and addressing EV impacts on the grid. The Company has also proposed to continue the PRI concept, now renamed the "Innovation portfolio," in its second TEP filing, which is now pending before the Commission in Proceeding 23A-0242E.[52]

Q. IS THE MARKET TRANSFORMATION PORTFOLIO BEING PROPOSED ONLY A PART OF THE CLEAN HEAT PLUS PORTFOLIO?

A. No. The Market Transformation Initiatives Portfolio is a set of important near-term, no-regrets projects that can be pursued regardless of what portfolio is approved

[52] Further descriptions of the PRI's current status, and the proposed Innovation portfolio, are available in the Direct Testimony of Company witness Mr. C. Andre Gouin in Proceeding Number 23A-0242E,

by the Commission.[53] I also think the Portfolio underscores an important point with this Clean Heat Plan: as we evolve the gas system and reduce emissions, a critical path to achieve emissions reductions in this sector is to drive collaboration and innovation, and "make markets" for new technologies and approaches. Regardless of what portfolio is chosen, partnership and collaboration will be required to ensure market adoption. Each of the proposed projects in and of themselves move in that direction, as I explain in more detail below.

Q. STARTING WITH THE INITIATIVES, WHAT STAND-ALONE MARKET TRANSFORMATION INITIATIVES IS THE COMPANY PROPOSING?

A. The Company is proposing the following specific, stand-alone Market Transformation Initiatives for Commission approval in this proceeding. Partners, where appropriate, are enumerated in parentheses:

- a Neighborhood Residential Electrification Retrofit project (CEO, Energy Outreach Colorado, City and County of Denver);
- an All-Electric New Residential Construction project (Rocky Mountain Institute);
- a Non-Pipeline Alternative for the Boulder Pearl Street Mall (City of Boulder, Boulder County);
- a Non-Pipeline Alternative for F-3 Aurora;
- Coalbed methane recovery (Southern Ute Indian Tribe and Colorado School of Mines);
- CNG Acquisition and Verification project (Williams);
- Hydrogen Blending; and

[53] The Cost Target Portfolio, which is limited in budget, may not be able to accommodate spending on both the Market Transformation Portfolio and spending on Clean Heat Resources. Nonetheless, the Company believes that the objectives of the Market Transformation Portfolio can complement any outcome the Commission selects.

- Advanced Leak Detection.

I describe each of these in turn below and further detail can be found in Attachment JWI-2.

1) **Neighborhood** Residential Electrification Retrofit:

In partnership with several stakeholders (the Colorado Energy Office, Energy Outreach Colorado, and the City and County of Denver Office of Climate Action, Sustainability & Resiliency), the Company will pursue a project to better understand how to achieve economies of scale in neighborhood recruitment and implementation of energy efficiency and beneficial electrification measures. The project will cover 100-200 participating single-family homes and will be compared against a control group of 100 single-family homes. The participants will include 50-100 income-qualified customers and 50-100 additional customers from across the income spectrum. The budget for the pilot will be approximately $10 million, including $4-5 million for providing retrofits to income-qualified customers' homes, $3-4 million for incentives for other customers, and an incremental $1-2 million for monitoring, verification, and reporting.

2) **All-Electric New Residential Construction** – Key Partners: Rocky Mountain Institute

In partnership with Rocky Mountai**n** Institute, this project seeks to better define the market, customer, and supply chain barriers to the widespread deployment of all-electric new construction, and the solutions to address those barriers. The project will be linked to a new development of 50-100

new all-electric single-family homes or developments, and compared against a control group of homes connected to electric and gas service. The budget for the project will be approximately $5 million, including $3 million for customer incentives and direct administrative costs, and an incremental $2 million for monitoring, verification, and reporting.

3) **Boulder Pearl Street Project Non-Pipeline Alternative** – Key Partners: City of Boulder and Boulder County

In partnership with the City of Boulder ("Boulder") and Boulder County, this project will explore the feasibility of pursuing a non-pipeline alternative ("NPA") portfolio, composed of electrification programs, to avoid the need for the planned Pearl Street Mall expansion project, which would avoid future gas investment for a specific segment of the Company's system. Given the scope and magnitude of electrification required to achieve the Clean Heat targets, this project will be important to help the Company understand and demonstrate the concepts of geographically targeted full electrification of certain portions of the Company's gas system. The NPA portfolio will cover approximately 66 customers on or in the vicinity of the Pearl Street Mall. The budget for the project will be approximately $5 million, including $3 million for electric distribution system upgrades, and an incremental $2 million for project implementation and incentive costs.

4) F3 Reinforcement NPA:

This project will explore the feasibility of pursuing a NPA portfolio to avoid the need for the planned F-3 reinforcement capacity expansion project

located in the City of Aurora, which would avoid future gas investment for a specific segment of the Company's system by reducing demand. The proposed NPA portfolio includes energy efficiency and beneficial electrification measures and technologies. This project will be important to help the Company understand and demonstrate the concepts of geographically targeted NPA programs in certain portions of the Company's gas system, including the annual customer adoption rates of gas demand reduction measures and the associated incentives required to influence customer participation. The NPA portfolio will cover approximately 1600 customers in Aurora. The budget for the project will be approximately $8 million.

5) **Coalbed Methane** – Key Partner: Southern Ute Indian Tribe

Using an innovative horizontal drilling technology for a shallow outcropping that is located on the Southern Ute Reservation, the project will achieve emission reductions because methane, which would otherwise continue to travel up the coal seam to the outcropping and be emitted to the atmosphere, will be collected, pressurized, treated for hydrogen sulfide, water and CO2 removal, and then injected into a natural gas transmission pipeline at the site. From there, it will be distributed to end users and combusted. This project prevents methane emissions to the atmosphere and displaces the use of conventional natural gas. This project is discussed further in the testimony of Company witness Mr. Weinberg, with a budget of approximately $2.7 million per year.

6) **Certified Natural Gas Pilot Acquisition** – Key Partner: Williams

In partnership with Williams, a mid-stream gas company, the Company intends to make an initial purchase of CNG from Williams subsidiary Sequent Energy Management LLC ("Sequent"). Williams has provided the Company with a representative offer for natural gas supply with a verified emissions profile for the production and gathering of the Colorado sourced supply. Williams is leveraging block-chain secured technology via Context Labs' Decarbonization as a Service™ platform to measure and verify emissions through the aggregation and reconciliation of multiple sources of data to provide a path-specific methane intensity certification that meets or exceeds industry leading measurement protocols. KPMG LLP performs third-party auditing for Williams of methane intensity certification and low-emission attributes. The verified emissions data provided through this project will include details on how emissions were measured, when they were measured, and details on the emission source. The detailed level of emissions data will enable us to provide an important signal to the market of the stringency and transparency we expect in future transactions.

The Company and Sequent anticipate contracting for 25,000 MMbtu per day of physical gas plus a small premium for the associated Environmental Attributes, which is included in the filed Clean Heat budget. The delivery period will begin shortly after Commission approval and will be for an initial term of 1-year. The Company anticipates this contract will jumpstart the market for CNG in Colorado and spur the development of additional offers

for CNG from Williams and other providers. The budget for this project is $1 million for one year. For further details on this initiative, please see the Direct Testimony of Dr. Sydnie Lieb.

7) <u>Advanced Mobile Leak Detection / LDC Methane Abatement</u>

Although significantly less emissions on a CO2e basis than customer combustion emissions, fugitive methane emissions from the gas distribution pipelines remains a source of GHG emissions that can be mitigated through advanced technologies not currently deployed today through traditional leak detection surveys. Advanced mobile leak detection ("AMLD") technology uses highly sensitive detection equipment mounted on vehicles to detect methane passing through its path. Compared to our traditional leak surveys that are conducted on foot and requires crew to take a leak detection device to the leak, AMLD will allow us to cover more area with the same crew, allowing leaks to be detected and repaired more quickly, thereby reducing GHG emissions associated with identified leaks and improving safety outcomes. This initiative will solicit an RFP to identify a technology vendor to partner with and purchase two mobile units to begin testing in select survey areas. The enhanced detection capability will not only allow us to identify and repair leaks faster, but the emissions measurements gathered from the initial AMLD units will allow us to calculate a more precise emissions factors to estimate our baseline emissions. We will also be able to determine a cost per metric ton of methane emission reductions to measure cost effectiveness of the technology.

The budget for the initial two units is approximately $4.5 million. Moreover, pending a review and evaluation of deployment of the first two AMLD units, the Company anticipates requesting Commission approval to purchase additional AMLD units in the future to scale the surveys to our entire service area. For further details on this initiative, please see the Direct Testimony of Mr. Ray Gardner.

8) <u>Hydrogen Blending Demonstration</u>

The hydrogen demonstration project is intended to demonstrate that the Company is able to safely and reliably blend hydrogen into its existing gas infrastructure and deliver it to customers. There are four major categories of technical considerations that the Company is evaluating through the project: hydrogen supply and storage, hydrogen blending and control, pipeline operations, and customer end-use. The Company will be further evaluating, and updating for scalability considerations, all safety, technical, engineering, operational, and reliability considerations respective to these four categories based on the demonstration project. For further details on this initiative, please see the Direct Testimony of Mr. Ray Gardner.

A. <u>Market Innovation Fund Concepts</u>

Q. IN ADDITION TO THESE STAND-ALONE INITIATIVES, WHAT MARKET TRANSFORMATION CONCEPTS IS THE COMPANY PROPOSING UNDER THE INNOVATION FUND?

A. We are proposing an innovation fund that can be used to develop and execute new, innovative concepts to drive scale in emissions reduction efforts. As part of

that fund, we are proposing several initial concepts listed below. We anticipate that additional concepts may be identified and considered as part of the fund process. The initially identified innovation fund concepts are as follows:

- Ground-source heating districts site assessment
- Strategic partnerships with large customers
- Carbon capture for flue gas
- Universal weatherization
- Recovered Methane Coal Mine Study
- Biomass Gasification with Biochar Offsets
- Direct air capture for synthetic natural gas production
- High Quality Carbon Offsets Study

Please see Attachment JWI – 2 for full descriptions of these innovation fund concepts.

Q. IN ADDITION TO THE MARKET TRANSFORMATION CONCEPTS DESCRIBED ABOVE, COULD OTHER CONCEPTS ALSO BE INCLUDED IN THE INNOVATION FUND?

A. Yes. The concepts described here are our initial ideas, and several have partners that are interested in pursuing their execution if approved by the commission. However, the concept is to have a flexible fund that can adapt to the interests and needs of our stakeholders and the market. We would welcome additional ideas that can be evaluated as funding options under the fund.

Q. IS THE COMPANY UNDERTAKING ANY OTHER PROJECTS OUTSIDE THE MARKET TRANSFORMATION PORTOFOLIO THAT MAY ALSO DRIVE EMISSIONS REDUCTIONS MEASURES UNDER CLEAN HEAT?

A. Yes, as part of our commitment to achieving emissions reductions in the gas sector, we are pursuing a variety of other projects that will lead to innovation and emissions reductions. We are not seeking Commission approval for these projects in this filing, so only provide a high-level overview for reference here. One of our more high-profile projects is our participation in an application for a $1.25 billion grant from the U.S. Department of Energy (DOE) for a Regional Clean Hydrogen Hub to advance the hydrogen economy across four Mountain West states: Colorado, New Mexico, Utah and Wyoming. The application, submitted by Western Interstate Hydrogen Hub LLC with the support of the four states, includes eight projects producing and consuming hydrogen from multiple types of production in several economic sectors. The Company is sponsoring one of the selected projects that would produce clean hydrogen in eastern Colorado for a variety of uses, including in electric generation and in hard-to-decarbonize sectors. More information can be found on the CEO website[54] and also in the testimony of Company witness Mr. Jensen. Further, in 2023, we made several pilot purchases of high-qualified offsets to advance opportunities to create cost-effective emissions reductions in Colorado.

[54] https://energyoffice.colorado.gov/climate-energy/western-inter-states-hydrogen-hub.

Q. PLEASE SUMMARIZE THE COMPANY'S REQUEST FOR APPROVAL AS IT RELATES TO THE MARKET TRANSFORMATION PORTFOLIO.

A. The Company has developed a budget, as explained in the next section of my testimony, for the Market Transformation Portfolio. We request approval and cost recovery for the specific Initiatives described above. We further request approval for the creation of the Innovation Fund and its initial budget, and approval to work with partners, customers, and stakeholders to advance the Concepts through the process as described above.

IX. BUDGETS, COST RECOVERY, AND RATE IMPACTS

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

A. This section of my testimony discusses the Company's requested budget for its Clean Heat Plan and preferred Clean Heat Plus portfolio, the Company's cost-recovery proposal, and the projected rate impacts of the plan.

A. Budgets

Q. PLEASE PROVIDE BACKGROUND ON THE BUDGET FIGURES TIED TO THE MODELING OF THE CLEAN HEAT PLUS PORTFOLIO.

A. To develop our proposed budget, the Company started with the modeling of the Clean Heat Plus portfolio performed by E3, which produced annual budget estimates by resource category for each year of the Clean Heat action period (2024 through 2028).

Q. PLEASE PROVIDE DETAILS ON THE COMPANY'S PROPOSED BUDGET.

A. The Company's proposed total budget for Clean Heat Plus, considering only the E3 modeled programmatic costs and excluding the Market Transformation Portfolio cost, is approximately $816 million over the Clean Heat Plan Action Period from 2024 through 2028. On an annual basis, the budget is $51 million and gradually increases to $248 million in 2028, for an average annual budget of $163 million during the action period. I note here the upward-trending slope of the budget. This is a function of some of the inputs to the model, and also how the model is solving toward increasingly stringent emissions targets over time. I further note that this ramp up shape is likely to be similar to the realities of implementing a program like this, as we are starting from the beginning with many of these

efforts, and seeking to steeply ramp up others. The presumed mid-2024 approval of this CHP also supports the lower budget in the early years of the action period.

Q. CAN YOU PROVIDE A BREAKDOWN OF THIS PROPOSED BUDGET BY PROGRAM?

A. Figure JWI-D-5 shows the budget for each program within the Clean Heat Plus portfolio for each year during the action period. In addition, the Market Transformation Portfolio costs are layered on to the modeled program costs in each year, resulting in the total Clean Heat Plan costs in the last line of the figure.

Figure JWI-D-5: Clean Heat Plan Budgets

Cost Category	2024	2025	2026	2027	2028
Additional Gas DSM	$15.6	$15.4	$16.2	$16.8	$17.1
Electrification	$19.9	$35.0	$57.7	$83.9	$106.2
Certified Natural Gas	-	-	$2.4	$4.6	$6.2
Offsets	$2.3	$4.2	$6.7	$8.7	$9.3
LDC Methane Abatement	-	-	-	-	-
Hydrogen	-	-	-	$5.7	$20.1
Recovered Methane	$13.2	$80.9	$89.2	$89.2	$89.2
Clean Heat Plus Program Costs	$51.1	$135.6	$172.2	$209.0	$248.2
Market Transformation Projects	$10.5	$20.8	$11.9	$5.3	$3.9
Market Transformation Fund	$2.5	$2.5	$2.5	$2.5	$2.5
Market Transformation Cost Total	$13.0	$23.3	$14.4	$7.8	$6.4
Total Clean Heat Plan Costs	**$64.1**	**$158.9**	**$186.6**	**$216.8**	**$254.6**

Q. HOW DOES THE COMPANY'S BUDGET COMPARE TO THE 2.5 PERCENT COST CAP?

A. The budget for Clean Heat Plus exceeds the cost cap, which is approximately $34 million per year. As discussed further in Section IV of my testimony, this budget is in the public interest because it will achieve significant additional GHG emission

reductions while maintaining reasonable costs to customers as the statute requires.

Q. HOW WILL THE COMPANY FOLD CLEAN HEAT INTO THE EXISTING DSM AND BE STRATEGIC ISSUES FILINGS?

A. The Company will provide a summary of its BE and DSM spending under its Clean Heat Plan in its future DSM/BE Strategic Issues application filings. This will provide the Commission with an overview of the Company's BE and gas DSM programming while maintaining clarity between existing BE and gas DSM and the additional BE and gas DSM the Company seeks approval of in this Clean Heat Plan. The Commission has ordered the Company to file its next Strategic Issues proceeding in 2025, to better align with the Company's next ERP.[55] That proceeding will be able to address BE and gas DSM issues relating to the next ERP and Clean Heat more comprehensively. Separately, the Company will report on its Clean Heat BE and gas DSM spending as part of its annual Clean Heat reporting.

B. <u>Cost Recovery</u>

Q. WHAT SHOULD BE THE GOAL OF THE COMMISSION'S APPROACH TO COST RECOVERY FOR UTILITY SPENDING ON CLEAN HEAT PROGRAMS?

A. The overarching goal of the cost recovery mechanisms in a Clean Heat proceeding should be to manage customer impacts and simultaneously provide appropriate regulatory support for the gas system evolution spurred by Senate Bill 21-264.

[55] Decision No. C23-0413 in Proceeding No. 22A-0309EG. Note that this decision is pending review on Applications for Rehearing, Reargument, or Reconsideration.

On the electric side, the Commission and utilities have significant experience implementing various cost-recovery mechanisms to support renewable generation. These mechanisms have come from both statute and the needs of particular cases, and have developed over many years. In contrast, the Commission and utilities are tackling cost recovery for the gas transition for the first time in the initial Clean Heat applications filed between now and January 1, 2024. As state policy on gas system decarbonization evolves, so too will the tools available for cost recovery.

Based on the Company's experience with implementing strategies to reduce emissions for its electric business, the Company believes cost recovery for the gas transition should:

- Provide rate stability to customers from Clean Heat efforts, provide timely recovery to the utility, fairly distribute costs among customers recognizing the cross-business benefits of Clean Heat Plans, and provide transparency to customers for Clean Heat Plan costs on their electric and gas bills.
- Incentivize the utility to undertake projects in furtherance of State policy objectives that the utility may not otherwise pursue; this consideration is particularly important for Clean Heat mechanisms that may reduce throughput or otherwise alter the fundamentals of the gas LDC business.
- Be flexible so that they can support each of the different types of technologies, consumer incentives, and other emissions reduction measures needed to make progress toward the Clean Heat Targets.

We anticipate receiving feedback on these mechanisms from other parties and expect that cost recovery approaches will continue to evolve as we implement this Clean Heat Plan, begin planning for the next one, and move forward with future actions to reduce emissions from the gas LDC business.

Q. DOES SENATE BILL 21-264 DISCUSS COST RECOVERY?

A. Yes. The section of the bill codified at § 40-3.2-108(6)(b), C.R.S. states that:

> The commission shall consider allowing current recovery for clean heat plan costs through a rate adjustment clause or structure that allows for current recovery, and a gas distribution utility may recover the prudently incurred costs associated with actions under an approved clean heat plan or actions to meet any additional emission reduction requirements imposed [by the AQCC] pursuant to section 25-7-105 (1)(e)(X.7).

This provision allows a utility to request a current recovery structure for costs under its Clean Heat Plan, and allows the utility to recovery its prudently incurred costs to implement an approved Clean Heat Plan. These directives support creating the correct incentive structure for gas utilities, consistent with the second objective discussed above.

Q. DOES THIS PROVISION REQUIRE CURRENT RECOVERY FOR ALL CLEAN HEAT PLAN COSTS?

A. The statute does not create a one-size-fits-all approach for recovery of Clean Heat Plan costs; rather, it provides the utility flexibility to propose different mechanisms for different programs within its plan, consistent with the Company's cost-recovery objectives discussed above.

Q. WHAT OTHER PARTS OF THE CLEAN HEAT STATUTE ADDRESS COST RECOVERY?

A. There is an interplay between the Clean Heat Statute and statutory provisions relating to beneficial electrification that is relevant to the determination of a cost recovery mechanism for Clean Heat Plans. Specifically, the Clean Heat Statute provides that "all requirements specified in this article 3.2 relating to beneficial

electrification labor standards, beneficial electrification plans, *recovery of costs*, and reporting apply" to beneficial electrification in a Clean Heat Plan.[56] This in turn is a reference to the sections of the statute covering beneficial electrification plans. The statutory provisions for beneficial electrification plans state that "[t]he commission shall allow an electric utility to recover its prudently incurred costs, on a *current basis*, for implementation of approved beneficial electrification programs."[57] In addition, the statute addresses incentive structures for beneficial electrification programming and investments, including incentive returns on equity and sharing of net-economic benefits.[58] These provisions provide further, and strong, support for a current cost recovery mechanism.

Q. DO ANY OTHER PROVISIONS OF SENATE BILL 21-264 BEAR ON THIS ISSUE OF COST RECOVERY?

A. Yes. When considering whether to approve a Clean Heat Plan, one of the balancing factors the Commission must consider is "[w]hether the clean heat plan results in a reasonable cost to customers, including savings to customer bills resulting from investments made pursuant to the plan."[59] The statute sets a cost cap of 2.5% of annual gas bills for all full-service customers, and allows the Commission to approve a Clean Heat Plan with costs greater than that level "if it finds that the plan is in the public interest, costs to customers are reasonable, the plan includes mitigation of rate increases for income-qualified customers, and the

[56] § 40-3.2-108(8)(c), C.R.S. (emphasis added).
[57] § 40-3.2-109(5)(a), C.R.S. (emphasis added).
[58] § 40-3.2-109(5)(b), C.R.S.
[59] § 40-3.2-108(6)(d)(I)(D), C.R.S.

benefits of the plan, including the social costs of methane and carbon dioxide, exceed the costs."[60] These provisions support the goal of balancing the bill impacts to customers, including income-qualified customers, with the goal of reducing GHG emissions, consistent with the objectives discussed above.

Q. PLEASE SUMMARIZE THE COST RECOVERY MECHANISMS THE COMPANY IS PROPOSING IN THIS CLEAN HEAT PLAN.

A. The Company is proposing to recover the costs associated with spending on the Clean Heat Plan in two new riders: the Clean Heat Support Gas Adjustment ("CHSGA") and the Clean Heat Support Electric Adjustment ("CHSEA"). Rider recovery manages and smooths the bill impacts from programming and investments to advance the measures needed to decarbonize the LDC system.

Costs for additional gas DSM, the incremental cost of Recovered Methane projects, offsets, and the incremental environmental attribute costs of CNG would be recovered from gas customers in the CHSGA. Future hydrogen projects for Clean Heat purposes could also be recovered in the CHSGA, at least in part depending on use, if and when they are approved.

Costs for beneficial electrification would be recovered from our electric customers in the CHSEA. Together, the CHSGA and the CHSEA would cover the Company's programmatic spending on its Clean Heat Plan, recognizing that different portfolios drive non-programmatic costs as well. This approach allows for easier tracking by the Commission and stakeholders and bill transparency on

[60] § 40-3.2-108(6)(d)(III), C.R.S.

programmatic costs for our customers. Both riders would have a similar structure and similar purpose to the Transportation Electrification Programs Adjustment rider, which captures the costs of Commission-approved TEP spending.

The Company is also proposing a voluntary Renewable*Connect—Natural Gas ("R*C-NG") product. The Company's RC*NG proposal is described in the testimony of Company witness Mr. Weinberg. R*C-NG program has the benefit of getting customers directly engaged in the process of reducing emissions from the LDC; indeed, it is a voluntary program that facilitates the partnership and collaboration with our customers and that we will ultimately need at scale, similar to the Market Transformation Portfolio at its core. The program will be cost-neutral to non-participating customers because the participating customers will pay the costs of the program.

Q. WHY IS THE COMPANY PROPOSING TO RECOVER SOME OF THE COSTS OF CLEAN HEAT FROM GAS CUSTOMERS AND SOME FROM ELECTRIC CUSTOMERS?

A. The Company has divided the costs of pursuing Clean Heat between gas and electric customers based on the nature of the programs and the changing makeup of our customer base as gas customers electrify. The programs included in the CHSGA involve improvements to the Company's gas system or emission-reduction measures related to molecules flowing through the Company's gas system. Beneficial electrification, by contrast, is designed to move customers' energy use from the gas system to the electric system. As gas customers shift their energy usage from gas to electricity, they may no longer contribute their fair

share for system-wide gas costs. Recovering certain programmatic costs from electric customers, therefore, ensures that electrifying customers pay an appropriate amount for their use of the system. Moreover, those customers' additional electric demand will generate more revenue for the electric system as well as likely drive incremental costs and investments in electric generation and delivery capacity.

If the costs to electrify gas usage were instead assigned to the gas side, the remaining gas customers would have to pay for a program that reduces sales volumes and likely increases overall average rates, while customers that electrify their energy use would not pay for the recovery of spending that directly benefits them. Beneficial electrification spending for Clean Heat should thus be allocated to the electric side. I recognize that this is a different approach than that used for the DSM-SI proceeding; however, it is appropriate here as we look at incremental, and potentially transformational, levels of beneficial electrification.

Q. WHY ARE THE COSTS OF ADDITIONAL GAS DSM, RECOVERED METHANE PROJECTS, LDC METHANE ABATEMENT, OFFSETS, AND THE INCREMENTAL ENVIRONMENTAL ATTRIBUTE COSTS OF CNG APPROPRIATE FOR RIDER RECOVERY FROM GAS CUSTOMERS?

A. As discussed in further detail in the testimony of Company witness Mr. Mark, the gas-side Clean Heat programs for gas DSM, recovered methane, and LDC methane abatement are capital-intensive. Current recovery through the CHSGA, rather than deferring and accumulating costs for eventual recovery in a general rate case, will smooth bill impacts to customers, as well as incentivize the

Company to invest in programs that it would not otherwise. Moreover, the cost of offsets and the incremental environmental attribute of CNG are incremental per-Dth costs associated with volumes flowing through the system. And including all program costs within the CHSGA will provide bill transparency to our customers of the total cost of implementing the Clean Heat Plan, and ease of tracking and accounting for the Commission and our stakeholders.

Q. WHY ARE THE COSTS OF ADDITIONAL BENEFICIAL ELECTRIFICATION APPROPRIATE FOR RIDER RECOVERY FROM ELECTRIC CUSTOMERS?

A. On the electric side, rebates and incentives for electrification are also cost drivers, and current recovery through the CHSEA will similarly help smooth bill impacts to our customers and provide the correct incentives for the Company. Like the CHSGA, the CHSEA will provide transparency for our customers about the costs of electrifying gas loads and important information for the Commission and our stakeholders. This approach is fully supported by statute as described above in the discussion of § 40-3.2-109(5), C.R.S., which is referenced in the Clean Heat Statute.

Q. PLEASE DESCRIBE HOW THE COMPANY PROPOSES TO RECOVER THE COSTS ASSOCIATED WITH CLEAN HEAT PLAN REBATES.

A. The Company proposes to recover annual revenue requirements associated with beneficial electrification rebates through the CHSEA, and additional gas DSM rebates through the CHSGA. Because Clean Heat Plan rebates incentivize and enable customers to make BE investments that will result in customer benefits, emissions reductions, and system efficiencies for years to come, the Company

supports spreading out related cost recovery over a commensurate period of time. Public Service therefore proposes to recover these costs through establishing a regulatory asset that is amortized over a 15-year period, which is generally consistent with the expected useful life of the equipment (e.g., heat pumps) that our proposed Clean Heat Plan rebates support.[61] For consistency, the Company proposes the same amortization period for gas DSM rebates. Under this approach, the Company would earn a return on the unamortized balance of the regulatory assets at the Commission-approved weighted average cost of capital ("WACC") for Public Service's electric utility.

Q. WHY DOES PUBLIC SERVICE SUPPORT THIS COST RECOVERY APPROACH FOR REBATES UNDER THE CLEAN HEAT PLAN?

A. The Company supports this cost recovery treatment for multiple reasons.

First and foremost, this proposed cost recovery approach will enable the Company to focus our rebates and investments in early adoption years to the extent practicable, when robust incentives are most critical to stimulate market transition, while mitigating near-term bill impacts associated with our Clean Heat Plan. This proposed approach alleviates near-term bill impacts for our customers by spreading the cost recovery for Clean Heat Plan rebates over multiple years rather than requiring customers to pay the full cost of rebates in the year they are issued.

[61] Mr. Mark supports the proposed 15-year amortization period in his Direct Testimony.

This approach will also prevent intergenerational equity issues that could otherwise result from recovering the full extent of these costs in the same year rebates are issued. The customer investments supported through Clean Heat Rebates will provide environmental, system, and customer benefits for multiple years into the future. For the same reason we spread out cost recovery for direct capital investment, it is just and reasonable for related cost recovery to align with these long-term benefits.

Finally, our proposed cost recovery approach will help ensure that the Company is financially incentivized to pursue Clean Heat Plan rebates, especially considering that such rebates are designed to displace potential capacity expansion investments to our gas system that the Company would otherwise undertake.

Q. HAS THE COMMISSION APPROVED SIMILAR COST RECOVERY TREATMENT IN ANY PREVIOUS PROCEEDINGS?

A. Yes. In Commission Proceeding No. 20A-0204E, the proceeding for our inaugural Transportation Electrification Plan ("TEP"), the Commission approved cost recovery for TEP rebates through a establishing a regulatory asset, amortized over 10 years, and earning a return on the unamortized balance at Public Service's Commission approved WACC.[62] In that case, the Commission also approved cost recovery of the associated annual revenue requirements through a rider. While the Commission's decision relied in part on statutory language particular to TEP

[62] Decision No. C21-0017 (mailed Jan. 11, 2021), ¶¶ 80-82, as modified by Decision No. C21-0117 (mailed Mar. 2, 2021), in Proceeding No. 20A-0204E.

rebates, the Commission concluded that "allowing Public Service amortize TEP rebates" was appropriate to "incent the Company to invest in TEP programs that use rebates."[63] The Commission further found that "amortization of rebates creates a more balanced incentive structure for TEP programs involving utility-owned assets and TEP programs involving only rebates."[64] These policy rationales would apply with equal force to Clean Heat Plan rebates, which would operate alongside of capital-intensive programs and are designed to reduce the need for investment in gas capacity expansions.

Q. MOVING BACK TO THE SCOPE OF THE BENEFICIAL ELECTRIFICATON PROGRAMS, WHY IS THE COMPANY LIMITING BENEFICIAL ELECTRIFICATION SPENDING TO AREAS WHERE IT PROVIDES BOTH GAS AND ELECTRIC SERVICE?

A. The Company is able to pursue an aggressive program of beneficial electrification in the Clean Heat Plus portfolio in part due to the fact that we provide the majority of our customers with both gas and electric service. When one of our dual-service customers electrifies, they will pay toward the recovery of those costs through the CHSEA. This allows for better matching in terms of cost-causation.

The same is not true, however, for customers to whom we only provide gas service. If the Company provides an incentive or rebate for those customers to electrify, they will leave the Company's systems entirely. The costs to electrify those customers would be borne by the customers on the Company's electric

[63] *Id.*
[64] *Id.*

system, who would receive no benefit from that spending in terms of spreading total system costs across additional electric load. The benefit to previous gas-only customers who electrify and move their energy use to a non-Company electric provider would also be an unfair cross-subsidization by the Company's electric customers.

To be clear, the Company is proposing this limitation only for incentives provided during this nascent stage of Clean Heat programs, and is not opposed to expanding electrification programs to its gas-only customers in the future. At the same time, from the Company's perspective, the change in providers that would occur from the electrification of gas-only customers implicates a type of "seams" issue; moreover, not all potential electric providers for our gas-only customers are likely to be parties to this Proceeding. We expect this will not be an issue unique to Public Service, however. And, recognizing the broader applicability of these questions and inquiries, the Company recommends that the Commission open a separate M Docket after the conclusion of this Proceeding to determine how best to handle cost-sharing between gas-only and dual-service customers. The Company would then use the results of that proceeding to craft an appropriate proposal to bring forward as part of its next Clean Heat Plan. In sum, this limitation would only exist until parameters are further vetted and discussed before the Commission in a non-litigated context.

Q. IS THE COMPANY PROPOSING ANY PERFORMANCE INCENTIVE MECHANISMS ("PIMS") AS PART OF ITS COST RECOVERY PROPOSAL IN THIS CHP?

A. While we are not proposing any PIMs at this time, I expect that to be a point of discussion as this inaugural Clean Heat Plan proceeding moves forward. On the one hand, we are in the early stages of this process and there is substantial uncertainty in program development and deployment; this may counsel against establishing a PIM at this time. However, to the extent the Commission believes a PIM is appropriate, the Company believes the best area to focus on would be beneficial electrification.

I say this for two reasons. First, it aligns the Company's incentives in promoting beneficial electrification with State energy policy objectives designed to achieve the same objective. Second, we have guidance from the General Assembly in § 40-3.2-109(5), C.R.S., as described earlier in my testimony.[65] Options for consideration could be incentive returns on equity based on achievement of certain levels of beneficial electrification, or a sharing of net-economic benefits from any beneficial electrification—both of which are contemplated in the statute.[66]

Finally, I note that, while we do not believe the time is right for establishing a PIM, the Company expects the discussion and believes the statute should guide any PIM development, be it in this CHP or a future CHP.

[65] § 40-3.2-109(5)(b), C.R.S.
[66] § 40-3.2-109(5)(b), C.R.S.

C. Gas Transportation

Q. WHAT ISSUES SHOULD THE COMMISSION BE AWARE OF WITH RESPECT TO THE COMPANY'S GAS TRANSPORT CUSTOMERS IN THIS CLEAN HEAT PLAN?

A. Transport customers are an important piece of reducing statewide emissions, and the Company offers several comments for the Commission's consideration in this case and in future Clean Heat Plan filings below.

Q. PLEASE PROVIDE SOME BACKGROUND INFORMATION ON THE GAS TRANSPORTATION CLASSES.

A. Gas transport represents approximately 50% of volume on the Company's gas system. Gas transport customers, also referred to as "shippers," receive gas from a physical connection to the Company's system and pay for system-wide costs as part of their transportation rates, but purchase their gas commodity from other entities. They are required to deliver the amounts of gas they consume to the Company's system, and often rely on third parties known as "marketers" to coordinate the actual purchasing and scheduling of gas. The gas transport class is varied, and includes commercial and industrial customers, among others, that choose to take transport rather than sales service, gas-fired electric generating units, and other LDCs that take gas from the Company's system and distribute it through their own systems to their retail customers.

Q. WHAT CHALLENGES DOES GAS TRANSPORT CREATE WITH RESPECT TO CLEAN HEAT?

A. Gas transport customers could present another significant potential "seam" issue that could impede progress toward the Clean Heat Targets, and the statewide emissions reduction goals as a whole. If the Commission exempts "retail" transport customers, including commercial and industrial customers, from paying for the costs of implementing a Clean Heat Plan, those costs will have to be paid entirely by the gas sales classes. In that scenario, sales customers would be incentivized to switch to transport service, removing them from the obligation to pay for Clean Heat programs and reducing the size of the remaining customer base whose share of the program costs would increase. This creates a potential positive feedback loop, in which customers shift to transport service, the remaining customers pay higher and higher bills, and neither the Company's gas sales customers nor the Company's system as a whole meets the Clean Heat Targets.

Q. ARE ALL GAS TRANSPORT CUSTOMERS SIMILARLY SITUATED WITH RESPECT TO THIS POTENTIAL PROBLEM?

A. No. The Company views transport customers as falling into three general categories that warrant different policy considerations with respect to Clean Heat.

- *Other Gas Local Distribution Companies* – The Company provides transport service to certain other gas LDCs, who then distribute gas from connection points on the Company's system to their own retail customers. Senate Bill 21-264 subjects gas LDCs to the requirements of Clean Heat, either as "gas distribution utilities," "small gas distribution utilities" with 90,000 or fewer customers, or as exempt municipal gas utilities.[67] The Commission will

[67] *See* § 40-3.2-108(1), C.R.S. (definitions); *see also id.* subsection 9 (requirements for small gas distribution utilities).

consider Clean Heat Plans and small gas utility emission reduction plans in other proceedings. The retail customers of other LDCs will be required to pay for the cost of those plans. If the Commission were to include the Company's LDC transport customers in cost recovery for the Company's CHP, it would represent a form of "double taxation" on those LDCs' customers. That was not intended by Senate Bill 21-264, is a poor policy outcome, and would be unfair to those customers.

- *Electric generating units* – The Company provides transport service to certain gas-fired electric generating units located within the geographic footprint of the Company's LDC. Colorado regulates these units through a comprehensive set of GHG emission-reduction measures for the electric sector, including in Clean Energy Plans under Senate Bill 19-236. That separate, comprehensive suite of regulations indicates that the General Assembly did not intend for these units to also be subject to the requirements of a Clean Heat Plan and including them in CHP cost recovery would present several potential complications.

- *"Retail" transport customers* – The Company provides transport service to various residential, commercial, and industrial customers. Unlike gas LDCs and electric generating units, these "retail" customers are similarly situated to residential, commercial, and industrial customers who take sales service. If the Commission wishes to decarbonize the Company's gas system, these customers should ultimately be included in Clean Heat planning. The Commission must also eliminate any ability of retail customers to "opt out" of the Clean Heat Statute by choosing transport service rather than electric service. These issues will become increasingly salient as we progress through subsequent CHP proceedings and the number of customers and throughput on the Company's gas system is reduced as load electrifies.

Q. WHAT IS THE COMPANY'S RECOMMENDATION FOR COST RECOVERY WITH RESPECT TO GAS TRANSPORT CUSTOMERS?

A. For purposes of its Direct Case, recognizing the complexities I just identified, the Company has not subjected any gas transport customers to the CHSGA. This issue should be the subject of discussion in this proceeding, however, and the Company recommends that the Commission order any cost recovery it deems appropriate with respect to transport customers while avoiding regulation of gas

transport customers separately subject to emissions reduction requirements (e.g., other LDCs and electric generating units).

Alternatively, the Commission could exclude all transport customers from cost recovery in this CHP consistent with the Company's Direct Case position. If it does so, the Commission should include transport customer issues as part of the proposed separate M Docket, as described above. The Company seeks input from other parties to this proceeding as to the appropriate path forward.

D. Clean Heat Support Adjustments

Q. PLEASE DISCUSS THE PROPOSED NEW CLEAN HEAT SUPPORT ADJUSTMENTS IN MORE DETAIL.

A. The Company proposes to use a similar mechanism for both the gas and electric cost-recovery mechanisms. The Company would derive an annual Clean Heat Resource Revenue Requirement which includes the cost of amortization including financing costs at the Company's WACC. The amount of each mechanism per dekatherm or per kilowatt-hour would be updated annually. Each adjustment would have a true-up for over- or under-recovery, with a symmetric carrying charge at the Company's WACC.

Q. SEPARATE FROM THESE COST-RECOVERY MECHANISMS, WHAT ARE THE OTHER FINANCIAL IMPACTS OF THE COMPANY'S CLEAN HEAT PLAN?

A. Implementing a Clean Heat Plan will reduce the amount of gas flowing through the Company's system and reduce the number of customers paying for gas service. This creates the potential need for decoupling or another mechanism to account

for lost revenues, which may need to be addressed in the Company's next gas rate case.

Q. HOW DOES THE COMPANY'S COST RECOVERY FRAMEWORK ALIGN WITH THE THREE KEY CONCEPTS YOU DESCRIBED EARLIER: BILL MITIGATION, INCENTIVES, AND FLEXIBILITY?

A. Recovering the costs of the Company's preferred Clean Heat Plus portfolio through the CHSGA and CHSEA smooths bill impacts to our customers. Recovering the costs of beneficial electrification programs from electric customers is fair to and mitigates impacts on customers remaining on the gas system, as is limiting those programs in this Clean Heat Plan to customers who receive both gas and electric service from the Company. And as I describe below in the discussion of rate impacts, the Company is proposing measures that target a portion of the Company's spending toward income-qualified customers and reduces their costs to decarbonize their homes. The CHSGA and CHSEA properly incentivize the Company to pursue Clean Heat investments, including investments that may reduce the value of its gas LDC system. The mechanisms are flexible in that they can cover each of the Clean Heat Plus programs, and can be used for new programs based on technologies that develop in the future without major modifications. In short, the CHSGA and CHSEA accomplish the Company's cost-recovery objectives with minimal additional overhead, using a mechanism that has proven to work well in other contexts.

Q. HOW WILL THE COMPANY'S COST RECOVERY FRAMEWORK EVOLVE BETWEEN NOW AND THE NEXT CLEAN HEAT PLAN AND GAS INFRASTRUCTURE PLAN FILINGS?

A. First, we recognize that the cost recovery mechanisms for Clean Heat will need to evolve as our system changes and as new technologies become widely available.

As just one example, House Bill 23-1252 includes Thermal Energy as a Clean Heat Resource for the Company's next Clean Heat Plan Filing, requires the Company to propose a Thermal Energy pilot project on or before September 1, 2024, and anticipates the growth of Thermal Energy systems as part of the business model of Colorado utilities. Those systems will be providing our customers with a new energy resource and will require their own separate cost-recovery structures to facilitate deployment and scaling and to mitigate bill impacts. And as I discussed earlier, this Clean Heat Plan is the start of conversation regarding cost sharing between gas and electric customers, regarding cost allocation for customers to whom we provide only gas or only electric service, and regarding how to allocate costs for the decarbonization of transport customers' use of our system. We anticipate those conversations will continue in the proposed M Docket, the Thermal Energy rulemaking, and future Clean Heat Plan and Gas Infrastructure Plan Filings.

Q. DO YOU HAVE ANY OTHER COMMENTS ON THE COST RECOVERY APPROACH PROPOSED BY THE COMPANY?

A. Just briefly. In the rulemaking proceeding that, among other things, set the rules for Clean Heat Plans, the Company raised on numerous occasions the need for

regulatory support in evolving the LDC. To be sure, that concept is not unique to Clean Heat Plans; it applies in the context of GIPs and other efforts as well. The proposed approach here, however, represents incremental progress in starting to build a framework that provides regulatory support. This is a multi-faceted discussion, as the directives and considerations in House Bill 23-1252 illustrate. Robust planning, starting with this Clean Heat Plan, will be informed by the direction that the Commission ultimately chooses to take both for the action period here (2024-2028) and for the long-term to 2050. But one thing is clear: these efforts will result in substantial changes to our gas LDC business and delivery infrastructure as technology advances and gas throughput changes. Accordingly, regulatory support and a reimagining of the regulatory approaches to support our LDC in this transition is in order. Our proposal here meets that objective for the near-term, recognizing that this discussion will evolve over time along with our plans as we continue the Clean Heat journey.

E. Rate Impacts

Q. PLEASE DESCRIBE THE RATE IMPACTS OF THE COMPANY'S PROPOSED SPENDING FOR THE CLEAN HEAT PLUS PORTFOLIO.

A. The CHSGA is projected to increase from $0.22 to $1.08 per dekatherm during the Clean Heat Plan action period due to program costs. This results in an approximately 10.9% increase in the average retail rate for gas sales customers by the end of the Clean Heat action period. Residential customers' average monthly usage over the course of the year is about 6.4 dekatherms, which means the average Residential bill impact would be $6.93 per month by 2028. However,

during the winter months of December through February average Residential usage increases to a monthly average of 11.6 dekatherms, meaning that the impact of the CHSGA would be $12.55 during the winter months in 2028. The following table summarizes the Company estimate of the CHSGA rider and the associated impacts on rates and bills.

Table JWI-D-5: CHSGA Rate Impact Analysis

	2024	2025	2026	2027	2028
CHSGA Annual Costs					
Incremental Gas DSM - Amortized Costs	$997,512	$2,947,503	$4,864,817	$6,804,113	$8,736,962
Certified Natural Gas	$0	$1,451	$2,417,731	$4,551,077	$6,226,595
Offsets	$2,340,250	$4,192,630	$6,719,480	$8,722,677	$9,295,955
Hydrogen	$0	$0	$0	$5,709,374	$20,130,005
Recovered Methane	$13,176,523	$81,548,520	$89,857,247	$89,857,247	$89,857,247
Market Transformation Projects	$12,300,000	$19,300,000	$11,850,000	$5,250,000	$3,850,000
Market Transformation Fund	$2,500,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000
Total CHSGA Costs	$31,314,285	$110,490,104	$118,209,275	$123,394,487	$140,596,764
Sales Volumes Adjusted for Decreases Associated with DSM & Electrification	143,829,097 Dth	142,308,373 Dth	139,218,140 Dth	134,878,924 Dth	129,924,793 Dth
Forecasted CHSGA Rate	$0.22/Dth	$0.78/Dth	$0.85/Dth	$0.91/Dth	$1.08/Dth
Baseline Average Rate Forecast	$9.07/Dth	$9.53/Dth	$9.04/Dth	$9.59/Dth	$9.90/Dth
Average Rate With CHSGA	$9.29/Dth	$10.31/Dth	$9.89/Dth	$10.50/Dth	$10.98/Dth
CHSGA Rate Impact	+ 2.4%	+ 8.1%	+ 9.4%	+ 9.5%	+ 10.9%
Average Monthly Residential Usage	6.4 Dth	6.4 Dth	6.4 Dth	6.4 Dth	6.4 Dth
Impact To Average Monthly Residential Bill	$1.39	$4.97	$5.43	$5.86	$6.93
Average Residential Usage - Winter Only	11.6 Dth	11.6 Dth	11.6 Dth	11.6 Dth	11.6 Dth
Impact To Average Monthly Residential Bill	$2.53	$9.01	$9.85	$10.61	$12.55

Rate impacts on the electric side of the bill are smaller. As previously discussed, the CHSEA electric rider will recover the amortized cost of beneficial electrification programs. Amortization helps to smooth the rate impacts to customers. The CHSEA rider would begin in 2024 with a very small charge of $0.00004/kWh and then grow to $0.00097 in 2028. By the end of the Clean Heat Plan action period, the CHSEA is forecasted to increase average rates by 0.7% and increase average residential bills by $0.59 per month.

Table JWI-D-6: CHSEA Rate Impact Analysis

	2024	2025	2026	2027	2028
CHSEA Annual Costs ($millions)					
Beneficial Electrification - Amortized Costs	$1,270,100	$4,732,958	$10,489,180	$19,168,422	$30,644,615
Total CHSGA Costs	$1,270,100	$4,732,958	$10,489,180	$19,168,422	$30,644,615
Sales Volumes Adjusted for Decreases Associated with DSM & Electrification	29,385,815,257 kWh	29,893,285,261 kWh	30,452,694,053 kWh	30,988,281,473 kWh	31,711,125,576 kWh
Forecasted CHSEA Rate	$0.00004/kWh	$0.00016/kWh	$0.00034/kWh	$0.00062/kWh	$0.00097/kWh
Baseline Average Rate Forecast	$0.12415/kWh	$0.12403/kWh	$0.12766/kWh	$0.12835/kWh	$0.13178/kWh
Average Rate With CHSEA	$0.12419/kWh	$0.12419/kWh	$0.12800/kWh	$0.12897/kWh	$0.13275/kWh
CHSEA Rate Impact	+ 0.0%	+ 0.1%	+ 0.3%	+ 0.5%	+ 0.7%
Average Monthly Residential Usage	606 kWh	606 kWh	606 kWh	606 kWh	606 kWh
Impact To Average Monthly Residential Bill	$0.03	$0.10	$0.21	$0.37	$0.59

Q. HAS THE COMPANY COMPARED THE RATE IMPACTS OF ITS PROPOSED CLEAN HEAT STRATEGY TO OTHER PRESENTED PORTFOLIOS?

A. Yes. We have prepared similar CHSGA and CHSEA estimated bill and rate impact analysis based on program costs for the Cost Target, Emission Target, and the Electrification Only scenario. The Company's proposal has overall lower bill impacts than both the Emission Target and Electrification Only scenarios. Because electrification costs are to be recovered through the CHSEA rider, the Electrification Only scenario has almost no impact on gas rates but will increase average electric rates by almost 9 percent. The following figures illustrate the results of our analysis.

Figure JWI-D-6: CHP Natural Gas Average Rate Impacts

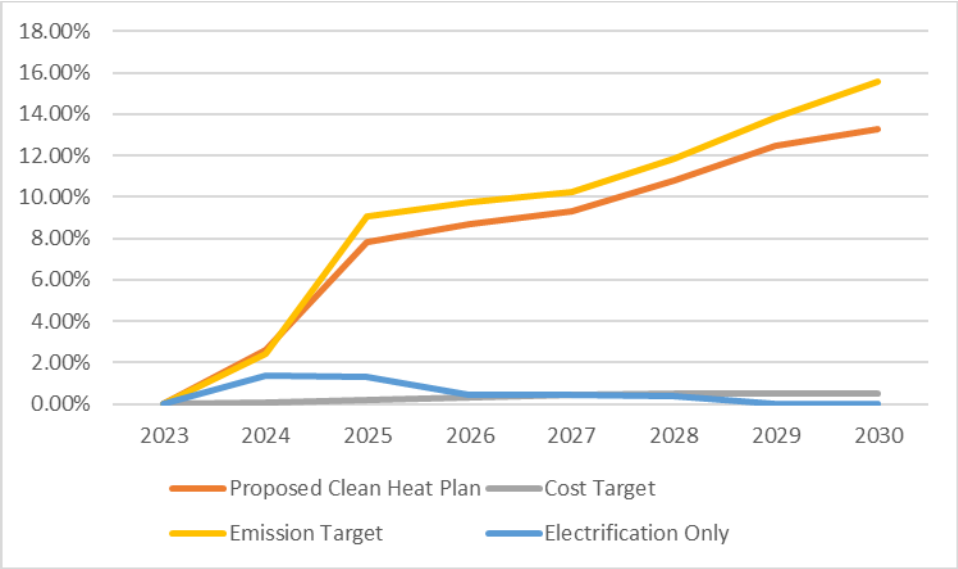
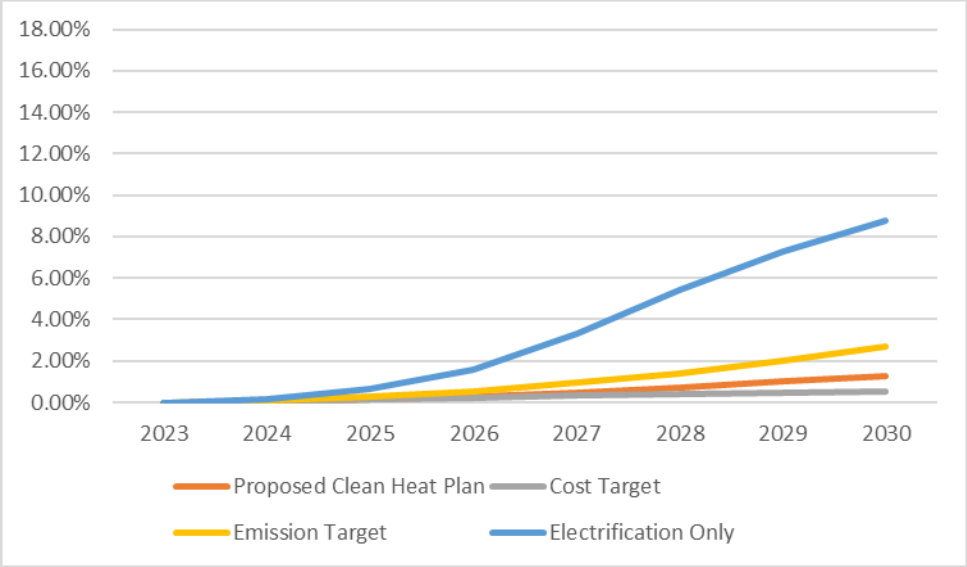


Figure JWI-D-7: CHP Electric Average Rate Impacts

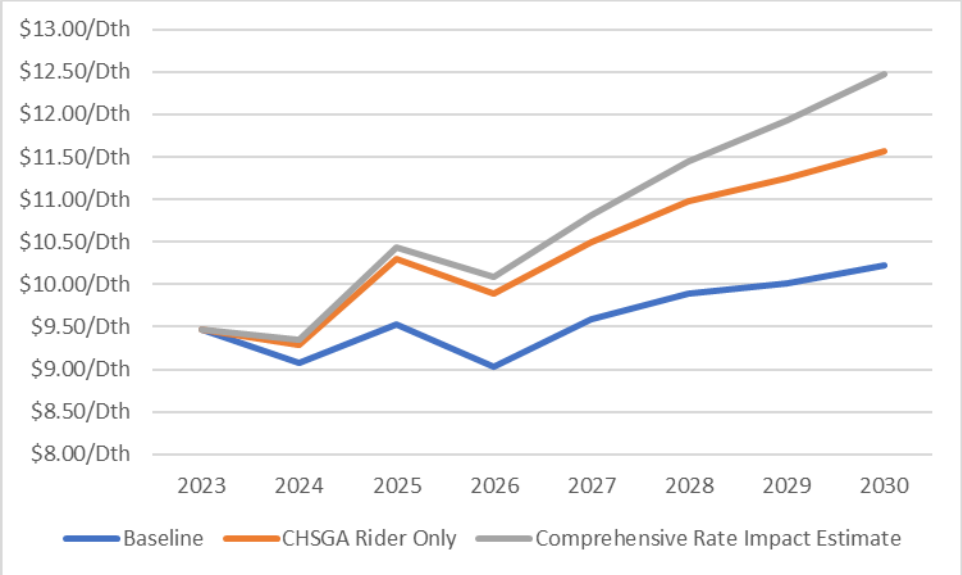


Q. IS THERE A MORE COMPREHENSIVE WAY TO ASSESS THE RATE IMPACTS OF THE COMPANY'S CLEAN HEAT PROPOSAL?

A. Yes. The Company's proposal will increase electric load, decrease natural gas load, and impact the peak demands on both systems and drive changes in capital investments going forward. The impacts on peak demands and capital investment

are quite speculative, but in order to provide a more comprehensive evaluation of the impact of the Clean Heat Plan the Company did develop an additional analysis that includes the impact of changing load on other rates besides just the CHSGA and CHSEA and the incremental capital increases or decrease. The following figures illustrate the impacts on overall system average rates and show that for the natural gas rates the comprehensive impact of the Clean Heat Plan will be greater than just the cost of the CHSGA rider. Because overall sales volumes will fall, base rate and other charges will also increase. This analysis does include some reduction in capital investment in the gas system, but those reductions are not sufficient to offset the impact of falling natural gas sales.

Figure JWI-D-8: Clean Heat Plus Average Rate Analysis – Natural Gas

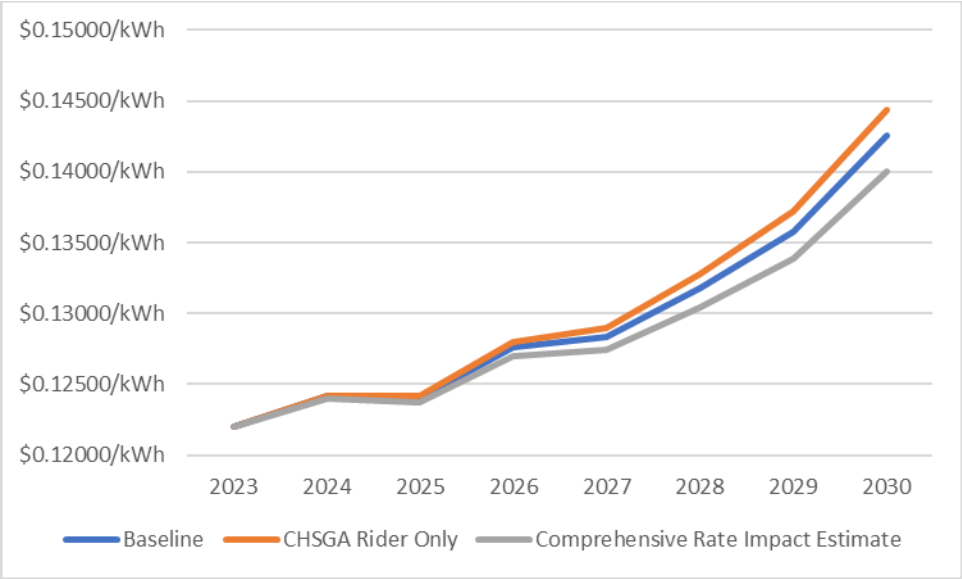


The results for electric rates show the opposite result. Under this preliminary analysis, and using amortization, increased electric sales will help to put slight downward pressure on base rates and other charges. This dynamic could change materially as further electrification drives increased need for incremental

distribution, generation, and transmission investments on the electric side of our business. The analysis here does include some degree of incremental capital investments in distribution, transmission, and generation but those increased costs are more than offset by the increased electric sales volumes.

The results of this analysis are critically dependent on the amount of full electrification versus the amount of hybrid electrification. Full electrification implies that the customer completely discontinues natural gas service which causes a substantial decrease in natural gas peak day demand and a substantial increase in electric peak load. Hybrid electrification implies that a customer electrifies most of their heating load, but maintains natural gas-based heating that is utilized during the coldest weather when the performance of air-source heat pumps is known to degrade. Under hybrid electrification, and under our current understanding of these impacts, there is little to no impact on ether the electric or natural gas peak demand. The analysis presented here is based on the assumption that about 44% of electrification applications are full and the remaining 56% are hybrid.

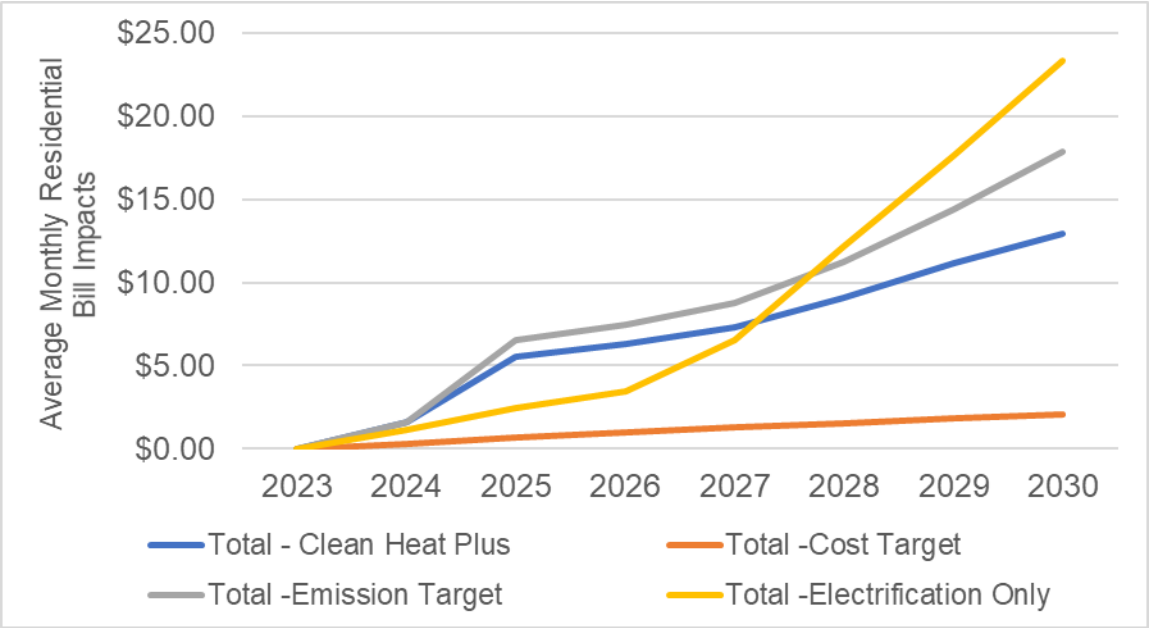
Figure JWI-D-9: Clean Heat Plus Average Rate Analysis – Electric



Q. DID THE COMPANY ESTIMATE A RATE IMPACT COMBINING THE EFFECTS OF THE CLEAN HEAT PLAN PORTFOLIOS FOR COMBINED ELECTRIC AND GAS CUSTOMERS?

A. Yes. Figure JWI-D-10 below shows the combined impact for an average combined electric & natural gas residential customer. This integrates the comprehensive impacts of changing volumes and associated capital investments as well as the direct costs of the Clean Heat portfolios. The lowest rate impact arises from the Cost Target portfolio, as expected. The Clean Heat Plus portfolio has the lowest combined rate impact among the portfolios that reach the 2030 target.

Figure JWI-D-10: Total Average Monthly Bill Impact for Combination Gas & Electric Customer



Q. WHAT IS THE COMPANY PLANNING TO DO TO REDUCE THE IMPACTS OF THE CLEAN HEAT PLAN TO INCOME-QUALIFIED CUSTOMERS AND DISPROPORTIONATELY IMPACTED COMMUNITIES?

A. The Company plans to direct 20 percent of its spending on additional demand-side management and beneficial electrification to programs that directly benefit IQ customers and DI communities. These programs will make it easier for these customers to obtain retrofits, heat pumps, and other services through increased incentives and vouchers. I will discuss IQ and DI programs in the next Section of my testimony.

Q. PLEASE SUMMARIZE THE RECOMMENDATIONS FROM THIS SECTION OF YOUR TESTIMONY.

A. I recommend the Commission approve the Company's budgets for the Clean Heat Plus portfolio overall, as well as the budgets for each program within Clean Heat Plus and the budget flexibility mechanism.

I also recommend the Commission approve the Company's proposed cost-recovery mechanisms for its Clean Heat Plan, which find support in Senate Bill 21-264 and include:

- Creating a new Clean Heat Support Gas Adjustment to cover costs for additional gas DSM, Recovered Methane projects, LDC methane abatement, offsets, and the incremental environmental attribute costs of CNG; and
- Creating a new Clean Heat Support Electric Adjustment to cover costs for additional beneficial electrification which includes the amortization of the costs of those programs.

X. INCOME-QUALIFIED CUSTOMER AND DISPROPORTIONATELY IMPACTED COMMUNITY ENGAGEMENT

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

A. This section of my testimony discusses aspects of the Company's Clean Heat Plan that relate to income-qualified ("IQ") customers and disproportionately impacted ("DI") communities.

A. IQ/DI Requirements

Q. WHAT DO THE CLEAN HEAT STATUTE AND COMMISSION RULES REQUIRE WITH RESPECT TO CLEAN HEAT PLAN SPENDING DEDICATED TO IQ CUSTOMERS AND DI COMMUNITIES?

A. Generally speaking, the Clean Heat Statute and Commission Rules provide that Clean Heat Plans should prioritize investments that ensure customers who live in DI communities and/or IQ customers have equitable access to the benefits from implementation of the plan, and the utility's selection of a preferred portfolio should include consideration of balancing and protecting DI communities.[68] In addition, the Clean Heat Statute states that if a Clean Heat Plan includes beneficial electrification, the statutory requirements relating to beneficial electrification plans apply.[69] Among those requirements is that at least 20 percent of the total beneficial electrification program funding is targeted to programs that serve IQ customers or customers who may reside in DI communities.[70]

[68] §§ 40-3.2-108(4)(c)(V), (6)(d)(I)(C), C.R.S.; Rules 4731(b)(I)(E), 4732(b)(IV).
[69] § 40-3.2-108(8)(c), C.R.S.
[70] § 40-3.2-109(2)(b)(II), C.R.S.

Q. WHAT IQ/DI SPENDING TARGET DOES THE COMPANY PROPOSE FOR ITS CLEAN HEAT PLAN?

A. The Clean Heat Statutes and Commission Rules do not set any other specific IQ/DI spending targets for Clean Heat Plans. Because the Company's Clean Heat Plan incorporates beneficial electrification, we have used the 20 percent statutory target to guide our incremental Beneficial Electrification and DSM program spending under the Clean Heat Plan, as I discuss below. This approach also aligns with the general provisions of Senate Bill 21-272, which require that retail customer programs, "including any associated incentives and other relevant investments, include floor expenditures, set aside as equity budgets, to ensure that [IQ] customers and [DI] communities will have at least proportionate access to the benefits of such programs, incentives, and investments."[71]

Q. WHAT DI COMMUNITIES ARE LOCATED WITHIN THE COMPANY'S SERVICE TERRITORY?

A. An interactive map of the Company's service territory showing disproportionately impacted communities is available online at https://xeago.maps.arcgis.com/apps/webappviewer/index.html?id=61a64d6f56d9445b979a7b0b6bff6b1b.

[71] § 40-2-108(3)(c)(II), C.R.S.

B. IQ/DI Budget and Outreach

Q. HOW DOES THE COMPANY PLAN TO SUPPORT AND PROTECT IQ CUSTOMERS AND DI COMMUNITIES UNDER THIS CLEAN HEAT PLAN?

A. The Company plans to direct 20 percent of its spending on beneficial electrification and incremental DSM and under its Clean Heat Plan to programs and outreach that directly benefit IQ customers and DI communities, regardless of which portfolio the Commission approves. The Company considers three guiding principles when planning programs and executing on outreach: affordability, accessibility, and building economic capacity.

All offerings and programs will help the customer with affordability. If programs risk short-term or long-term affordability concerns, then the program will be required to adjust to help the customer or other existing programs will either be adjusted or created to protect affordability. Moreover, collateral materials and the Company website about the programs and how to sign up for a program must be easily understandable and available in Spanish language if necessary. Outreach events will also be designed for the customer and organized with the intent of ease to attend. And finally, the Company will consider compensation for anyone who provides support of program development and education as well as the planned outreach work. This is appropriate because the Company believes there is an opportunity for partnerships with entities to offer workforce training and upskilling for beneficial electrification. The Company will follow the guidelines above so that these programs will make it easier for customers to obtain retrofits, heat pumps, and other services through increased incentives and vouchers while not increasing

the cost burden. The Company also plans to increase its outreach to IQ customers and DI communities in order to maximize the pace and equitable distribution of its Clean Heat programs, as I discuss below.

Q. WHAT IS THE COMPANY'S PROPOSED IQ/DI BUDGET UNDER ITS PREFERRED CLEAN HEAT PLUS PORTFOLIO?

A. Table JWI-D-7 shows the Company's proposed IQ/DI budget by resource type for Clean Heat Plus.

Table JWI-D-7: Clean Heat Plus IQ/DI Budget ($M)

	2024	2025	2026	2027	2028
Beneficial Electrification	4.0	7.0	11.5	16.8	21.2
Additional Gas DSM	3.1	3.1	3.2	3.4	3.4
Total	7.1	10.8	14.8	20.1	24.7

In total, the Company aims to spend $76.8 million that is targeted to DI communities and IQ customers under Clean Heat Plus during the five-year plan period, or an average of $15.4 million per year. The Company's projected IQ/DI spending under other portfolios would consist of the same 20 percent of the projected budget for beneficial electrification and additional gas DSM for those portfolios. I want to note, however, that the uncertainty regarding the ability to deploy Clean Heat Plan dollars, described at length in Section VI of my Direct Testimony, is equally if not more applicable to the IQ/DI allotments discussed above.

Q. WHY IS THE COMPANY PROPOSING TO FOCUS ITS IQ/DI BUDGET ON BENEFICIAL ELECTRIFICATION AND INCREMENTAL DSM?

A. The Beneficial Electrification and DSM programs are the plan's direct, customer-facing programs. Focusing on these components of the Clean Heat Plan will be the most impactful and cost-effective way to direct funds to IQ customers and DI communities; this will allow the Company to most effectively prioritize those customers and ensure they receive benefits from Clean Heat investments. This approach also aligns with the "retail customer program" focus established by Senate Bill 21-272, as I discussed above. At this time, the other Clean Heat Resources and Clean Heat Plus Additional Measures focus on specific infrastructure projects (e.g., recovered methane and hydrogen) or purchases that benefit the entire gas LDC system (e.g., CNG). As such it is not practicable to orient those programs towards IQ customers and DI communities. To the extent the other Clean Heat measures expand to incorporate customer-facing initiatives in the future, it may make sense to establish additional specific IQ/DI budgets for those measures in future Clean Heat Plans.

Q. HOW WILL THE PROPOSED MARKET TRANSFORMATION PORTFOLIO SUPPORT IQ CUSTOMERS AND DI COMMUNITIES?

A. The Colorado Energy Office, Energy Outreach Colorado, and the City and County of Denver's Office of Climate Action, Sustainability & Resiliency, and the Company have proposed a residential retrofit Market Transformation Initiative that aims to develop tools that will accelerate the pace of retrofits for IQ customers and in DI communities. The Initiative will include 50-100 IQ customers, including both

renters and homeowners, who will receive retrofits and other necessary upgrades free of charge. These retrofits will likely reduce energy burden for these IQ customers. The pilot will also explore other opportunities to reduce energy burden including energy efficiency, Community Solar Garden participation, Solar*Rewards, or other opportunities as available. An outcome of this Market Transformation Initiative is to better understand how to deploy and scale residential retrofits to IQ customers, which is of critical interest to each of the partners supporting this project.

Q. TURNING TO OUTREACH, HOW HAS THE COMPANY WORKED TO SUPPORT EQUITY CONSIDERATIONS ACROSS ITS OTHER RECENT FILINGS?

A. The Company has continuously expanded its efforts in recent years to increase the focus on supporting IQ customers and DI communities across our range of customer programs. Starting with our 2022-2025 Renewable Energy Standard Compliance Plan ("2022-25 RE Plan") approved last year, the Company agreed to develop and execute a comprehensive IQ/DI Community Engagement and Outreach Plan. That outreach plan entails the Company working with stakeholders, such as community-based organizations, to develop a list of organizations that serve IQ customers and DI communities, ensuring support for community engagement, outreach, and program implementation. Identified organizations would then be contracted to support program development, education, and outreach. The Company is currently working to implement its outreach plan through two channels: the first directly engaging with customers to

educate and assist them in signing up for the various program offerings available to them, and the second working through formal partnerships with community-based organizations who in turn organize community ambassadors and customer meetings to help educate and promote energy benefits and options as well as educate on specific customer offerings.

The Company has also committed in its recent DSM Strategic Issues and Transportation Electrification Plan ("TEP") proceedings to include outreach on its DSM and TEP proposals within the IQ/DI Community Engagement and Outreach Plan, explaining that it intended to coordinate the outreach plan across the Company's multiple customer-benefitting program offerings in order to create efficiencies and provide for a more holistic engagement approach. This is why the Company is proposing a similar IQ/DI outreach and engagement approach for this Clean Heat Plan.

Q. HOW DOES THE COMPANY PLAN TO INCREASE ITS IQ/DI OUTREACH AND ENGAGEMENT UNDER THE PLAN?

A. The Company plans to make use of existing relationships, such as its Energize Together outreach program, which was established as a partnership with the Latino Community Foundation of Colorado ("LCFC") to implement the 2022-25 RE Plan, and to build similar partnerships with other organizations to reach other communities within our service territory. The Energize Together program is an initiative aimed at increasing education, awareness, and engagement to IQ customers and customers in DI communities through a bottom-up, community-centric approach. The program also builds partnerships with organizations and

community ambassadors who already focus on outreach efforts and work within the communities. The Company hopes to continue the work in partnership with LCFC and build upon their existing network and expertise to identify and recruit local Energy Ambassadors and Energy Access Hubs, with annual summits organized to engage in discussions about energy-related issues, available programs, community engagement, and data on energy program usage by IQ customers and DI communities.

Q. WHAT ARE ENERGY AMBASSADORS AND ENERGY ACCESS HUBS?

A. Energy Ambassadors are recruited from IQ and DI communities to undergo comprehensive training in Colorado's energy infrastructure, policies, and available programs. They provide education through group or one-on-one interactions to raise awareness and promote programs, in addition to serving as liaisons between Xcel Energy and the community. Energy Access Hubs are a network of trusted nonprofits identified to serve as enrollment centers for IQ and DI communities, offering support for application completion, technical assistance, and bill assistance.

Q. WHY IS THE COMPANY PROPOSING TO MIRROR THIS APPROACH FOR ITS CLEAN HEAT PLAN IQ/DI OUTREACH?

A. This approach adheres to the principle of accessibility and recognizes that for ease and understanding, customers should have one point of access and should see their energy options as a whole and not in parts. We believe that the Energize Together model will work well for tackling the challenges of implementing the Clean Heat Plan, and there are efficiencies to be had by driving multiple Company

outreach programs (e.g., Clean Heat Plans, RES Plans, Strategic DSM Plans, and Transportation Electrification Plans) through these same partnerships. This approach also makes the best use of the engagement opportunities with communities and helps to avoid "outreach fatigue" by discussing issues, products, and offerings in a more integrated fashion. Using this model as a starting point, the Company commits to a continuous improvement model where if needed can pursue additional community partnerships to further expand its outreach and engagement efforts as part of implementing this and future plans.

Q. DO YOU HAVE ANY ADDITIONAL COMMENTS ON THIS OUTREACH?

A. As we allocate budget dollars specifically to reach out to IQ customers and DI communities, in addition to the programming itself, we can facilitate a dialogue to inform future Clean Heat Plans. In our group and one-on-one engagement in partnership with community organizations, the discussion is not intended to be a one-way notification of what programming is available. To be sure, making customers aware of programs is key to driving the uptake that we need to see for these programs to be successful. But these discussions and engagements can also offer an opportunity for customers to tell the Company and community representatives what *they* want to see and what they need help with for their energy use, and to provide key information for us to potentially build programming or adjust programming in future Clean Heat Plans. This is the spirit in which we approach this effort, and the outreach and engagement above is designed to facilitate and elicit that type of information so we can develop programming and

products that adhere to our guiding principles; affordability, accessibility, and building economic capacity.

Q. DO YOU HAVE ANY FINAL THOUGHTS REGARDING THE COMPANY'S PROPOSED IQ/DI APPROACH IN THIS PLAN?

A. I would stress that the Company's proposals here represent our good faith effort to align our programs with the spirit of the Clean Heat Statute regarding prioritization of IQ customers and DI communities. While we believe our proposed approach is a good starting point for this first plan, and one that will lay a strong foundation for future IQ/DI initiatives as the Commission's Senate Bill 21-272 implementation process proceeds and the Company continues to learn from its community engagement, we recognize that others may have different ideas for how best to carry out the Legislature's directives in the Clean Heat Statute. The Company welcomes input from parties on ways to cost-effectively prioritize IQ customers and DI communities in this Clean Heat Plan and is open to continue exploring options through stakeholder engagement processes.

XI. LABOR STANDARDS AND JUST TRANSITION

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

A. This section of my testimony addresses the labor provisions of Senate Bill 21-264 and Commission Rules, and the Company's plans with respect to labor standards in the context of this Clean Heat Plan.

Q. PLEASE DESCRIBE THE LABOR PROVISIONS IN SENATE BILL 21-264 AND COMMISSION RULES.

A. The Clean Heat Statute requires gas utilities to use its own employees on utility-owned projects that are part of a Clean Heat Plan, where practicable.[72] For projects of $1 million or more that are part of a competitive solicitation, the utility must require bidders to provide detailed information about the use of Colorado-based and out-of-state labor, which the utility must provide to the Commission.[73] DSM and beneficial electrification programs within a Clean Heat Plan must follow the labor standards applicable to those programs, as set forth in §§ 40-3.2-105.5 and -105.6, C.R.S.[74] When approving a Clean Heat Plan and the Clean Heat Resources acquired as part of a plan, the Commission must consider "whether the plan provides long-term impacts on Colorado's utility workforce as part of a just transition including consideration of [] labor metrics and benefits."[75]

[72] § 40-3.2-108(8)(a), C.R.S.
[73] § 40-3.2-108(8)(b), C.R.S.
[74] § 40-3.2-108(8)(c), C.R.S.; *see id.* § 40-3.2-105.5 (labor standards for gas DSM projects); *id.* § 40-3.2-105.6 (labor standards for beneficial electrification projects).
[75] Rule 4732(b)(VI); *see* § 40-3.2-108(8)(d), C.R.S.

Q. HOW DOES THE COMPANY'S CLEAN HEAT PLAN CREATE LONG-TERM POSITIVE IMPACTS ON COLORADO'S UTILITY WORKFORCE AS PART OF A JUST TRANSITION?

A. The Company has been a leader in the just transition in Colorado. The Updated Settlement Agreement for our Electric Resource Plan and Clean Energy Plan in Proceeding No. 21A-0141E charts a bold path for our workforce and communities with extensive provisions to ensure a just transition *and* reducing emissions. The need for a just transition is just as salient for our gas LDC business as it is for our electric one. As I previously discussed, emission reduction planning for gas utilities is much newer than for electric utilities, and this proceeding represents the first step in incorporating a just transition framework into gas-side planning. We seek input from the Parties and the Commission in this Proceeding to begin that process, and expect it will be an ongoing discussion as our gas system evolves over the next several CHPs on the path toward net-zero in 2050.

The Company's employees are a key part of Colorado's utility workforce. The Company does not anticipate that its gas LDC workforce will decrease during the action period. However, we are mindful that the gas system will change as we moved toward 2050, reducing the size of the workforce needed to maintain it. This Clean Heat Plan will create jobs across the portfolio of measures included in Clean Heat Plus—jobs installing heat pumps and upgrading building electric infrastructure; jobs retrofitting homes and building new electric-only homes; and jobs facilitating the purchase and transport cleaner molecules on the remaining gas system. The implementation of beneficial electrification in this and future plans

will also create job opportunities on the electric side as we meet our customers heating needs with efficient electric power. Those jobs will not only help the Company transition its gas LDC workforce when appropriate, but also grow the number of utility jobs in Colorado.

Q. WHAT IS THE COMPANY'S PROPOSAL FOR A JUST TRANSITION FOR ITS GAS LDC WORKFORCE?

A. The Company is committed to actively assisting our gas workforce through the decarbonization of the LDC system. As mentioned, we see only a limited impact to our gas LDC workforce during the action period for this Clean Heat Plan, as under any scenario there will still be a gas system in 2030 which must be safely operated and maintained. The Company has deep experience with developing and implementing successful, low-impact workforce transition plans, and we intend to bring our knowledge from the experience of retiring our coal fleet to the transition of the gas LDC. On the electric side, the Company employs a five-step process, as outlined in the Clean Energy Plan filing in Proceeding No. 21A-0141E:

- *First*, the Company models the impacted workforce, inventories skills, identifies future opportunities, and crafts a workforce transition plan.
- *Second*, the Company identifies transition opportunities from future assets, potential contractor insourcing, and natural attrition across all operations business areas.
- *Third*, the Company conducts transition conversations with impacted works, maps employee aspirations to opportunities, and performs skill gap analyses.
- *Fourth*, the Company creates and deploys workforce transition resources and rolls out transition pathways for affected workers, who then execute upon their transition plans.
- *Fifth*, the Company updates the workforce transition plan, and updates the Commission and key stakeholders.

The Company believes this process will also work well on the gas side. The Company seeks input as to how to craft the details of a just transition plan for our gas LDC workforce, which we will bring forward in our next CHP filing—while collaborating with our labor partners in the interim. Moreover, Senate Bill 23-292 recently was passed by the General Assembly and signed into law by Governor Polis. This law includes new labor requirements that will likely be applicable to Clean Heat Plan programming going forward, and we will collaborate with our employees and labor partners to ensure requirements are met.

Q. HOW DOES THE COMPANY'S CLEAN HEAT PLAN COMPLY WITH THE STATUTORY LABOR PROVISIONS?

A. The Company will use its workforce to the extent practicable, require the submission of labor information from bidders in competitive solicitations, and comply with the DSM and beneficial electrification labor standards as required by statute. The Company will report on labor impacts in its annual Clean Heat Plan reports as required by Commission Rules.[76]

Q. DO YOU HAVE ANY OTHER COMMENTS REGARDING LABOR STANDARDS AND METRICS?

A. Just one. The Company's preferred Clean Heat Plus portfolio is ambitious and will require extensive scaling up of the Company's existing DSM and beneficial electrification programs, as well as projects in new areas such as recovered methane and hydrogen in industries that are still developing. This is the

[76] *See* Rule 4733(a)(VII)-(VIII).

Company's first CHP, and the newness and extent of the work required to achieve the Clean Heat Targets makes it difficult to estimate the total labor impact of the plan with certainty. We anticipate being able to provide more detailed labor metrics and more detailed projections for labor impacts in our next CHP, when we will be better able to evaluate how each Clean Heat Plus measure has performed over the course of the action period. I want to be clear, however, that we firmly believe that Clean Heat Plus will create jobs during the next five years across the measures in the portfolio. This Clean Heat Plan will support existing utility workers in Colorado and create new jobs for electricians, construction workers, and home energy technicians as we embark on this ambitious journey to a Clean Heat future.

XII. 2023 CHP EXPENSES

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

A. In this section of my Direct Testimony, I support the Company's request to defer expenses associated with preparing and litigating this proceeding. Specifically, the Company requests deferral of expenses related to consultant work, transcripts and hearing costs, and outside legal counsel.

Q. PLEASE LIST AND GENERALLY DESCRIBE THE MAJOR EXPENSE CATEGORIES YOU ARE PRESENTING FOR DEFERRAL.

A. The major categories of expenses for the Company's 2023 CHP are listed below with a brief description for each.

Consultants: Consultants are necessary for the preparation of a CHP for a number of reasons. Often consultants will testify or provide subject matter expertise, perform specific analyses, provide review of testimony, and respond or consult on discovery. Typically, the expertise sought from the consultant is not an expertise that is hired on a permanent basis within the organization.

Transcripts/Hearing Costs: During the course of a proceeding, a court reporter will be necessary to transcribe depositions and hearings before the Commission. There is a cost of having court reporters record and transcribe these proceedings. This fee increases or decreases based upon the timeframe by which the reporter is asked to prepare the transcript.

Legal Counsel: The Company has an in-house legal department whose regulatory team works on the matters that we have before the Commission. However, the Company has more Commission-related work than can be cost-

effectively handled by our in-house attorneys alone, so we also need to retain outside attorneys for this work. Particularly since this CHP represents one of the most complex and involved regulatory filings Public Service makes and is not filed every year, the Company has not staffed up its legal department to specifically prepare the CHP filing, though we do assign inside attorneys to our cases, including this case. Given the specific needs of this filing, reliance on outside counsel is necessary and appropriate.

Q. PLEASE DISCUSS THE SPECIFIC CONSULTANT AND OUTSIDE WITNESS COSTS THAT THE COMPANY IS PROJECTING TO INCUR FOR THIS CHP.

A. The costs associated with securing outside consultants or witnesses with specific areas of expertise are necessary for the support and completion of the case. We estimate these costs to be $900,000 at this time for consulting services provided by Energy and Environmental Economics, Inc.

Q. PLEASE DESCRIBE THE SERVICES THAT WERE OR WILL BE PROVIDED BY E3.

A. Company witness Mr. Dan Aas provides Direct Testimony that introduces and discusses the portfolio modeling E3 conducted on behalf of Public Service. More specifically, he discusses the input assumptions, model methodology, and results of the modeling of the Clean Heat portfolios presented in this CHP.

Q. PLEASE DISCUSS THE TRANSCRIPT AND HEARING COSTS THAT THE COMPANY IS PROJECTING TO INCUR AS PART OF THE CHP PROCEEDING.

A. The Company anticipates incurring an approximate cost of $54,500 for the purchase of transcripts of the hearings and other hearing costs.

Q. PLEASE DISCUSS THE OUTSIDE LEGAL FEES THAT THE COMPANY IS PROJECTING TO INCUR AS PART OF THE CHP PROCEEDING.

A. Outside Legal costs are estimated to be $1,223,100 for the legal services provided by Wilkinson Barker Knauer, LLP ("WBK") for the CHP process. WBK was retained for its expertise and specific knowledge of Public Service and other Xcel Energy operating companies. The firm provided, or will provide, assistance in assembling testimony and attachments, witness preparation, responding to discovery, and generally processing the case. I would also add that the Company's internal legal team works hard to ensure that duties are appropriately assigned to outside legal counsel and to ensure that work efforts are not duplicative. The internal and external legal teams work as a unit and are in constant coordination to be as efficient as possible.

XIII. CLEAN HEAT 2050 – STARTING THE DISCUSSION

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

A. This section of my testimony presents the preliminary analysis the Company has undertaken relating to the future of its gas LDC system in 2050 under a Clean Heat future. The Company is not requesting that the Commission make any decisions in this Proceeding regarding emission reductions pathways through 2050—that would be premature. Instead, the purpose of this section is to begin a dialogue about the long-term future of the Company's gas system and Colorado gas policy under the deep decarbonization scenario envisioned in the goals of Senate Bill 23-016.

Q. WHY IS THE COMPANY DISCUSSING WHAT ITS GAS LDC MAY LOOK LIKE IN 2050 IN THIS PROCEEDING, WHEN THE CURRENT CLEAN HEAT ACTION PERIOD EXTENDS ONLY TO 2028?

A. This Company's first Clean Heat Plan covers the next five years, but the Clean Heat Statute will require the Company to file additional plans to meet future GHG emission reduction targets, including an eventual target for 2050. The Commission has held Commissioner Information Meetings and a Rulemaking regarding Clean Heat and the decarbonization of gas, but this Proceeding is the first opportunity to specifically consider the long-term future of the Company's LDC system. Although the modeling for 2050 is preliminary and must be viewed in the context of multiple, substantial uncertainties about policy, technology, markets, and customer choices over the next two and a half decades, we believe it is worth looking at what the model can tell us now. This Proceeding provides an initial forum before the

Commission to begin thinking about the future of the Company's gas LDC system, rather than postponing that discussion to a future miscellaneous docket or stakeholder process.

Q. WHAT IS THE COMPANY'S APPROACH TO DISCUSSING THE FUTURE OF CLEAN HEAT IN 2050 IN THIS PROCEEDING?

A. The information presented in this Proceeding should be viewed as the start of a scenario-planning exercise. It is important to recognize that the Company's modeling for 2050 is preliminary. There are many unknowns between now and 2050: the growth of our customer base, our customers' choices, policy decisions by this Commission and new laws from the General Assembly, the speed at which technologies develop, the pricing of options for DSM, electrification, and low-carbon molecules, climate change, and new energy technologies and energy uses that are yet to be invented. This analysis is high level and is not perfect. Nonetheless, we can take what we know about our gas LDC system, the policy pathway set forth in the Clean Heat Statute, and our assumptions about various emission reduction options, and use that information to frame a discussion of various scenarios.

Q. HOW DID YOU DETERMINE WHICH SCENARIOS TO EXAMINE?

A. We chose to examine two end points, based on a fundamental question about the future of the Company's gas LDC system: *Will that system still exist in 2050, or will it be diminished and possibly no longer used in whole or in part?* That is not a question we can answer in this Proceeding, as understanding the pros and cons of these two futures requires additional study and input from stakeholders across

Colorado, including the General Assembly—and including our customers. There are multiple ways to reach each of these two end states, but they require substantially different policy and regulatory measures to provide the legislative and regulatory support necessary to achieve them. Given the importance of those differences, the Company presents its preliminary analysis of the two scenarios reflecting these futures as a starting point for the 2050 discussion.

Q. PLEASE DESCRIBE THE TWO END POINTS IN MORE DETAIL.

A. The first end point, the "2050 Clean Molecule Future," represents a continuation of the Clean Heat Plus concept that abates emissions through a diverse portfolio of options including those that use the LDC. The LDC infrastructure remains to some extent but is primarily used to deliver cleaner molecules than geologic gas. Some level of new business and capacity may be allowed if it is served by Clean Fuels. LDC infrastructure investments are limited to safety and relocation, as well as incremental investments that may support the incorporation of Clean Fuels (e.g. hydrogen blending, syngas, and RNG). Hydrogen blend is assumed to increase from 5% to 20% by volume. Any remaining geologic gas is assumed to be certified to an extremely low leakage rate. Negative emission technologies (including Direct Air Capture, Point Source Capture (e.g. flue gas), and Offsets are required.

In the second end point, the "2050 All Electric Future," the role of the gas LDC is greatly diminished and is being strategically pruned as fast as reasonably possible without minimizing reliability or safety for any remaining gas customers. Nearly all buildings become all-electric. Any remaining geologic gas needed for LDC customers is assumed to be for the last fraction of the building stock that has

not yet turned over and/or hard to electrify industrial processes. It is possible that the LDC system may serve that last fraction of demand or be eliminated. This potential future will require policy interventions to alter the Company's obligation to serve.

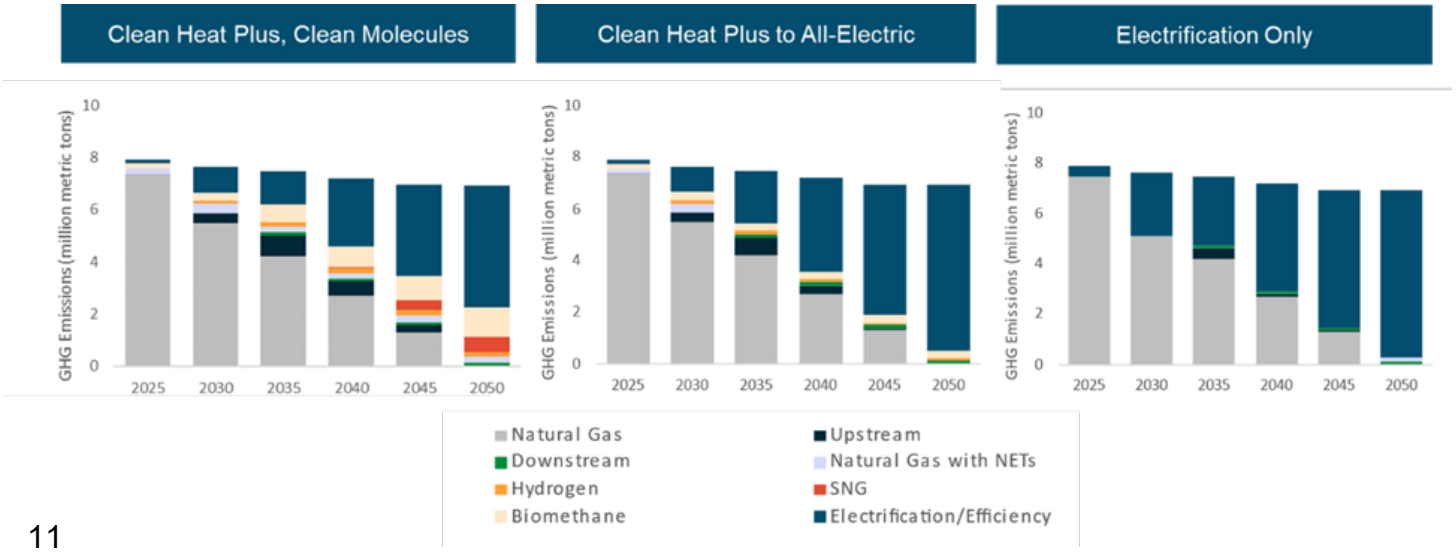
Q. HOW DID THE COMPANY MODEL THE SCENARIOS TO REACH THESE END POINTS?

A. E3 performed an analysis of these scenarios using a PATHWAYS-like model of the Colorado economy similar to the model used to conduct the analysis behind the Colorado GHG Roadmap. The models begin in 2030 using the end states of the Clean Heat Plan modeling of the Clean Heat Plus portfolio and the Electrification Only portfolio. The models consider three 2030 to 2050 scenarios. Two scenarios proceed from the 2030 Clean Heat Plus starting point to the 2050 Clean Molecule Future endpoint and to the 2050 All Electric Future endpoint. A third scenario begins with the 2030 Electrification Only starting point, heading to the 2050 All Electric Future endpoint. The 2050 Clean Molecule Future is not used as an endpoint from the 2030 Electrification Only starting point, as it is assumed that the Commission chooses not to use RNG, hydrogen, and offsets in the Electrification Only portfolio and that markets for those products therefore do not develop; similarly, it is assumed in this scenario that the Commission chooses not to pursue the negative emissions technologies required for the 2050 Clean Molecule Future endpoint.

Q. WHAT ARE THE IMPORTANT TAKEAWAYS FROM THIS ANALYSIS ON THE GAS SIDE OF THE BUSINESS?

A. There are several takeaways. First, all three model runs show large amounts of electrification by 2050. Even in the 2050 Clean Molecule Future, electrification is the dominant source of emission reductions. Second, in all three model runs, upstream emissions reductions (e.g., CNG) appear in the 2030-2040 timeframe, then taper off, suggesting CNG is a useful "bridge" tool for emissions reductions while the system electrifies. Third, as expected, the Clean Molecule future features a more diverse set of reduction options playing a role throughout the forecast.

Figure JWI-D-11: Emission Reduction Resource Composition Through 2050

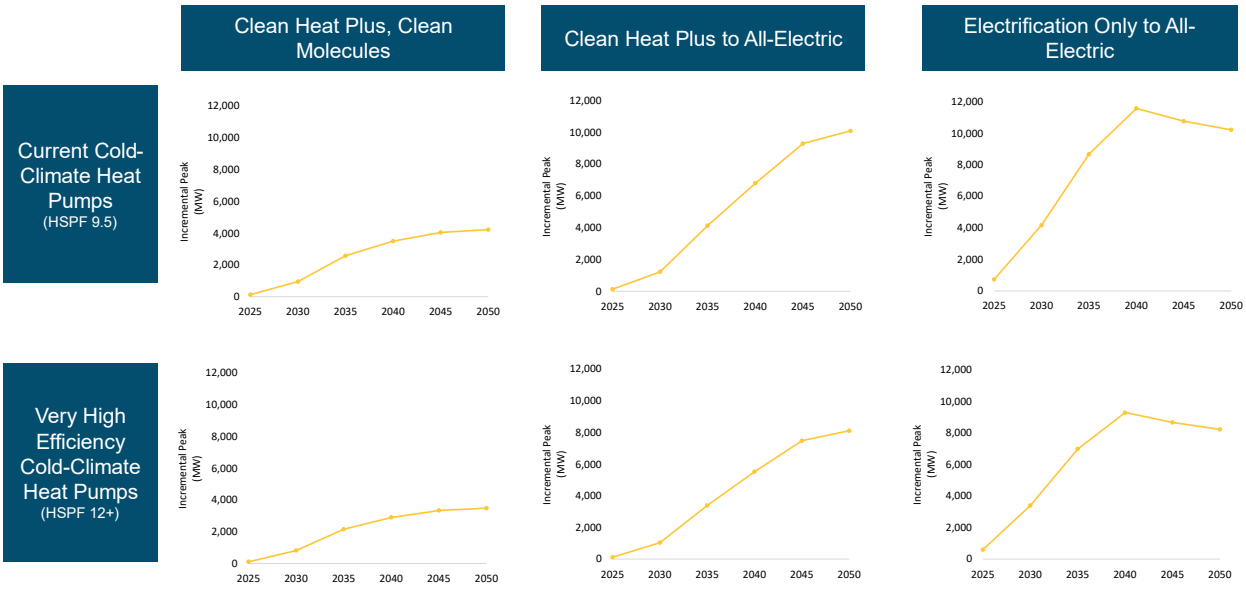


From E3's analysis, I also note that both futures show a significant decline in gas throughput, with the All-Electric future approaching zero throughput. In the Clean Molecules future, the gas LDC throughput is approximately 20 percent of today's throughput by 2050.

Q. WHAT ARE THE IMPORTANT TAKEAWAYS FROM THE ANALYSIS ON THE ELECTRIC SIDE OF THE BUSINESS?

A. Figure JWI-D-12 below shows increases in electric peak demand in all scenarios. The needed peak demand is much higher in both scenarios leading to the All-Electric end point. We note here that the Electrification Only to All-Electric scenario has a steeper increase in incremental peak demand to power its faster deployment of heat pumps. This would drive higher incremental grid investment costs sooner. While we have characterized below the needed 2050 peak demand and commensurate increase in incremental electric system capacity, that snapshot misses the faster ramp rate in this scenario. By contrast, Clean Heat Plus to All-Electric relies on a more diverse portfolio that defers some electrification through the 2030s and avoids the need for some incremental grid capacity.

Figure JWI-D-12: Electric Peak Demand Across 2050 Future Scenarios



Figures show incremental winter peak demands at 6am during a 90th percentile cold-snap

Q. HAS THE COMPANY ESTIMATED THE CAPITAL INVESTMENT ON THE ELECTRIC SIDE BASED ON THE SCENARIOS TO GET TO THESE END POINTS?

A. Yes. We used outputs from the E3 analysis to estimate incremental capital expenditures on the electric side of the business, and also reductions in capital investment in the gas LDC. For 2050, we estimated the capital expenditures for the electric business resulting from increases in coincident and non-coincident peak demand arising from the significant expansion of air source heat pumps. Specifically, we imputed incremental coincidental peak demand from "all electric" heat pumps where applicable. We did not impute any additional coincidental peak demand from "hybrid" heat pump installations where a gas furnace remains and is likely covering the bulk of the peak demand through the gas system on the coldest days – an assumption which may underestimate some degree of incremental coincidental peak demand. We created estimates for incremental capital investment across generation, transmission, and distribution where appropriate. However, we did not impute incremental generation and transmission investments until portfolios caused enough incremental demand to move winter peak higher than summer peak. In all portfolios, incremental distribution costs are estimated as double the current embedded costs to reflect the costs of newer equipment.

The results below show the potential significance of capital investments driven by customer electrification over the long term. The All-Electric future is expected to require significantly more capital investment in infrastructure, as it relies fully on electrification options to achieve long-term and deep emissions

reduction. The Clean Molecule future shows lower but still significant incremental investments.

Table JWI-D-8: Incremental Capital Investment in Electric System in 2050 ($M)[77]

	All-Electric	Clean Molecule
Low Estimate	$26,987	$9,608
High Estimate	$34,249	$12,332
Average	$30,618	$10,970

Q. HAS THE COMPANY CREATED AN ESTIMATE OF AVOIDED GAS INFRASTRUCTURE COSTS?

A. Yes. Following similar logic, we developed high-level estimated costs of the potential impact on the gas system with significant electrification albeit at different levels for the All-Electric and Clean Molecule end points. This process also began with outputs from E3's modeling of these futures, followed by a Company estimation of the change in capital investment through 2050. The difference is that this analysis is estimating a *decrease* in cumulative capital expenditures as the role of the gas system declines over time, especially in the All-Electric future where the gas LDC is greatly reduced to ultimately serving a few thousand remaining customers. The basic methodology was to reduce annual capital investment proportionally to decreases in peak demand on the gas system. Both the Clean Molecule and the All-Electric futures reduce capital expenditures into the gas LDC. Through 2050, Clean Molecule avoids $5.9B in gas capital costs, and All Electric avoids $9.4B in gas capital costs. We emphasize that these are very high-level estimates, and also note that under all scenarios, we must continue to make

[77] The Low and High estimates in this table reflect different potential efficiencies of heat pump technologies.

investments, albeit at somewhat reduced levels over time, to maintain the safety and reliability of the gas system.

Q. GIVEN THE INCREMENTAL ELECTRIC CAPITAL EXPENDITURES, AND THE AVOIDED NATURAL GAS CAPITAL EXPENDITURES, ESTIMATED ABOVE, ARE THERE ANY KEY OBSERVATIONS FROM YOUR PERSPECTIVE?

A. Yes. This exercise illustrates a few things to me. First, both future feature high levels of electrification as the LDC evolves. With that comes meaningful levels of avoided natural gas infrastructure costs. At the same time, accommodation of the transitioning loads onto the electric side of our business will require billions in electric investment—above and beyond investments we will need to make as we drive our electric system to net-zero in 2050, and far more than what is avoided in natural gas infrastructure investment. This exercise is not exhaustive, and it is not perfect. But I do think it serves to start a dialogue, with analytic support, of how we move towards the State of Colorado energy landscape of the future.

Q. WHAT ARE SOME OF THE UNCERTAINTIES ASSOCIATED WITH THE TWO PRIMARY 2050 END POINTS?

A. Both end points involve uncertainties that we are not able to quantify. There are uncertainties as to the pace of technology advancement, whether we are able to craft the right regulatory policy to incentivize electrification and clean molecule markets, whether our customers will respond to those incentives and make voluntary choices that align with the policy pathway, the price of natural gas and other commodities, the price and availability of heat pumps and other devices, the

number of electricians and other contractors needed for installations and retrofits, and population growth.

For both end points, and particularly for the 2050 All Electric Future, there are numerous unknowns regarding the cost, safety, timing, and management of the process of selectively "pruning" portions of the gas system that are no longer used. This is a new challenge that will require significant additional planning over the coming decades. Relatedly, there are uncertainties as to the regulatory treatment of both "stranded assets" and equities relating to customers remaining on the gas system.

As our customers electrify the energy services they currently receive from the gas system, the Company will need to build additional generation to serve load, particularly during the winter heating season when energy usage on the gas system peaks. The level of investment in generation required to meet that additional demand is not certain and depends on many factors that will be explored in future Electric Resource Plan proceedings. Additional investment in our electric distribution system will also be required.

These factors contribute to uncertainty in the ultimate impact to customers in terms of both gas bills and electric bills. There are also costs that customers must bear to electrify as well outside of their electric and gas bills as they transition a household or other premises to electrification.

There are also broader legal and regulatory uncertainties. At present, the Company has a duty to serve its existing customers and serve any new gas customers wishing to join the system. This is really just the beginning; the 2050

All-Electric Future scenario requires a recalibration of the regulatory support structure for our business that would take numerous discussions and actions from a variety of bodies, including the General Assembly and this Commission. Put simply, that scenario would thus require new laws to be passed to accommodate full electrification in 2050 and beyond.

On the regulatory front, the path to 2050 will evolve over multiple Clean Heat Plans and Gas Infrastructure Plans, as well as in Electric Resource and Clean Energy Plans as our customers electrify. These proceedings will occur over many years, under multiple Commissions, and across different leadership at the Company, state agencies, and stakeholder entities over the next 30 years. We do not know what choices the people who will fill our shoes will make, nor even what options they will have to choose from. The Company's gas LDC system will evolve as a result of many future Commission decisions, not just the decisions made in this proceeding, and we cannot predict now how those decisions may affect the path we ultimately take to 2050.

Q. IS THE COMPANY'S ANALYSIS OF THESE LONG-TERM SCENARIOS COMPREHENSIVE?

A. No. Both the modeling and the discussion of assumptions and uncertainties is preliminary. This is a higher-level analysis than the one we have conducted for the Clean Heat Plan and its 5-year action period. The Company seeks input from the parties regarding its analysis of these scenarios.

Q. DOES THE COMPANY HAVE A PREFERENCE FOR ONE LONG-TERM VISION OF THE FUTURE OVER THE OTHER?

A. Not at this time. The Company is neither advancing one long-term future over the other nor proposing that the Commission choose between them. That "choice" will not happen during this Proceeding. Coloradans will determine the path for the Company's gas system over multiple years in multiple forums, including at the Commission, at the General Assembly, and in meetings with our customers and stakeholders. To be clear, the Company and Xcel Energy have not ruled out either long-term future or any point between the two. The Company expects that its views regarding these scenarios will evolve during the course of that conversation.

Q. HOW DOES THE LONG-TERM SCENARIO ANALYSIS REFLECT BACK ON THE DECISIONS THAT THE COMMISSION MUST MAKE IN THIS PROCEEDING?

A. It is important that the Commission base its decision to approve the Company's Clean Heat Plan on the modeling and information regarding the action plan period and the modeling period through 2030. As I have stated, the long-term scenario planning for 2050 should be seen as a separate exercise that begins a dialogue and does not lead to specific decision points for the Commission in this proceeding.

That said, we understand the Commission and Parties will have an eye toward the future even as they focus on the next five years. And the Company intends its Clean Heat Plan to be the first step on a path toward a net-zero gas system in 2050. That path must align with our core mission as a utility: to deliver safe, reliable, and affordable energy for our customers—regardless of the whether

that energy is in the form of electric power, gas, clean molecules, or thermal energy. The high-level takeaways from the 2050 scenario analysis can inform our decisions today, around the edges, by helping us make sure we can meet that goal regardless of the policy decisions made in this and future Clean Heat Plan proceedings.

Q. WILL THE COMPANY'S PREFERRED CLEAN HEAT PLUS PORTFOLIO MEET THAT GOAL?

A. Yes. An important result of our long-term scenario analysis is that the Clean Heat Plus portfolio is compatible with both the 2050 Clean Molecule Future and the 2050 All-Electric Future scenarios. The portfolio invests heavily in electrification and related DSM strategies, which will grow the related markets in Colorado and enable additional levels of electrification in Clean Heat Plans beyond 2030. At the same time, the portfolio employs a diverse set of emission reduction measures that reduce bill impacts to our customers in the near-term while reducing emissions across different parts of the economy and setting us up for additional delivery of hydrogen and recovered methane under a net-zero clean molecule pathway. The analysis in this section shows that the potential cost-reducing benefits of Clean Heat Plus through deferred electric system infrastructure investments may even persist well past the action period of this Clean Heat Plan and into the 2030s. In other words, the Clean Heat Plus portfolio and its use of a diverse set of resources allows for aggressive but sustainable growth of electrification over time and at a pace that can manage investments to meet peak demand on the electric side of our business.

XIV. CONCLUSION

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.

A. I recommend that the Commission:

- Approve the Company's 2024-2028 Clean Heat Plan;
- Approve the selection of Clean Heat Plus as the preferred portfolio for the Clean Heat Plan;
- Approve the Company's proposed Market Transformation Portfolio, including the Market Transformation Initiatives and the Innovation Fund;
- Approve the Company's proposed budgets within the Clean Heat Plus portfolio and the Market Transformation Portfolio, as supported by the testimony of the Company's witnesses;
- Approve the Plan, Do, Check, Act framework, including the 60/90-Day Notice process and the budget flexibility mechanisms;
- Approve the Company's proposed cost recovery mechanisms, including the Clean Heat Support Gas Adjustment and the Clean Heat Support Electric Adjustment;
- Open an M Docket within 60 days of a final order in this Proceeding to explore open issues such as seams, cost-sharing between electric and gas customers, the treatment of transportation customers, and other issues that require Commission and stakeholder input prior to the filing of the Company's next Clean Heat Plan;
- Approve the Company's proposal to file its next Clean Heat Plan no later than August 1, 2027;
- Approve the Company's proposal to track and defer costs incurred in association with preparing and litigating this proceeding into a non-interest-bearing regulatory asset to be reviewed for recovery purposes in a future rate proceeding; and
- Grant any waivers or variances the Commission deems necessary for approval and implementation of the Clean Heat Plan.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Statement of Qualifications

Jack W. Ihle

Jack Ihle is Regional Vice President of Regulatory & Strategy Analysis for Xcel Energy – Colorado. He leads a team responsible for regulatory aspects of resource planning, renewable energy planning, electric vehicles and other policy issues. He has testified before the Colorado Public Utilities Commission, the Colorado Legislature, the Minnesota Legislature and the New Mexico Environmental Improvement Board.

Mr. Ihle previously worked in environmental policy for ten years, most recently serving as Director of Environmental Policy while leading Xcel Energy's climate policy, environmental policy and environmental communications efforts across the eight states in which the Company operates. Mr. Ihle has also served in energy consulting roles with IHS and Platts, focusing on renewable energy, climate policy and forecasting engagements.

Mr. Ihle has a Master of Science degree in Energy & Resources from the University of California at Berkeley, and a Bachelor of Arts degree in Political Science from Bowling Green State University. He has served on the boards of the Regional Air Quality Council, Volunteers for Outdoor Colorado, XPAC, the Solar Technology Acceleration Center and WEST Associates.