

Questions and Data Requests from Workshop 1

Questions for Public Service Company of Colorado:

- Provide the weather assumptions, residential home characteristics, heat pump characteristics (size, efficiency, cut-off temperature), furnace characteristics (size, efficiency, stages/modulation details) and any other relevant assumptions as well as the full executable Excel model used to produce the 8760 hypothetical model presented during the workshop held July 18, 2024, on the slide titled, “Relationship Between Throughput and Capacity.”
 - Please identify the average temperature in which the model triggers the gas backup to run for the heat pump with gas backup system.
 - The chart included in the Company’s slide deck for the July 18, 2024, workshop appears to show the gas backup being triggered as late in the winter as mid-April and as early as early November. Please explain the assumptions for heat pump performance, weather and building envelope that make the heat pump insufficient during these times.
 - What is the approximate time duration of the modeled peak gas usage event for the air source with gas backup?
 - How does that assumption compare to typically observed gas peak shapes and durations for residential heating?
 - Does the Company have any data from in-field or third-party testing or monitoring to support the outcomes presented in the model regarding the frequency and scale of use of the backup heating for the heat pump with gas backup system?
- Company representatives described how customer data is linked to associated model nodes (see slide 9) in developing and verifying the gas planning capacity expansion model.
 - Please describe this process in further detail including:
 - an explanation of what defines or delineates a “node” on the system including a physical description of the equipment types the Company uses to define nodes;
 - the number of nodes currently on the system as well as the number of nodes the Company used in their most recent capacity expansion annual process and the Company’s methodology for which nodes were chosen for the analysis;
 - the minimum, maximum and average number of customers contained within the nodes on the system;
 - whether each individual customer is downstream of and has their usage attributed to a single node or multiple nodes; and
 - if a customer is assigned to multiple nodes, please describe the assigning methodology.

- Please describe the feasibility of the Company providing to the Commission a GIS-based map of the nodes used to conduct this analysis, perhaps as part of system mapping submitted in a GIP.
 - Please also evaluate the feasibility and data structure of these maps to reflect nodes for which there is a performance discrepancy between the modeled data and SCADA data. Lastly, please evaluate the feasibility of conducting the 5-year forecast design day planning models by node.
- Please provide the data the Company collected during its most recent Home Energy Use Survey including the following:
 - A copy of the full survey that was sent to customers
 - Explanation of the number of customers who receive the survey, the Company's methodology for choosing customers to get a reasonable sample, and the number of respondents.
 - Summarized results showing tallies of responses to each survey question and any comparisons to responses from previous surveys.
- Identify and explain how the outcomes of the Home Energy Use Survey are being utilized to influence the Company's forecasting for its 2025 GIP. Specifically, what data outputs from the survey are being utilized, how is the Company utilizing the sampled data to update or influence forecasted sales or capacity values, and to what degree have forecasted growth rates in customer count, sales or capacity been impacted by inclusion of the Home Energy Use Survey data?
- Regarding the most recent residential forecasts developed by the Energy Demand Forecasting unit integrating impacts from the Amended Preferred Portfolio from the Company's Clean Heat Plan (Proceeding No. 23A-0392EG), as mentioned on slide 6 of the Company's presentation provide data and trend lines for Company's projected customer counts.
 - In this model, what percentage of new development does the Company assume to be fully electric? Does this vary by geographic location?
 - Is there a specific inflection point of appliance adoption or gas system rates in which the model assumes any acceleration in customer's either electrifying certain end uses or voluntarily disconnecting from the system?
 - What throughput and peak demand does the model estimate for customers who only have a gas range and/or gas fireplace? Why did the Company decide to only include this model in its low growth scenario for the 2025 GIP?
- Describe, in detail, the Company's anticipated approach for the "Planned Future Improvements" to forecasting as identified on slide 6 of the Company's presentation at the July 18 workshop. Please provide any available detail about what factors, data sources and methodologies the Company plans to use to improve upon the forecasting approach. Specifically identify improvements targeted at incorporation of the forecasting factors listed in Rule 4553(b).
 - As part of planned forecasting improvements, Company representatives indicated that the Company plans to produce 5-year forecasted planning models at the "metro" or "division" level. Please identify the geographic scope the Company

foresees as being included in a “metro” or “division” level, including the average number of customers that would be contained in each level. If it is helpful, utilize a demonstrative map to identify the geographic scope associated with these terms.

- Please provide data indicating the following for the past 3 years (2021, 2022, and 2023):
 - The average monthly usage (Dth) per residential customer for the entire gas system.
 - The average monthly usage (Dth) per commercial customer for the entire gas system.
 - The average monthly usage (Dth) per residential customer for buildings located in the City of Boulder
 - The average monthly usage (Dth) per commercial customer for buildings located in the City of Boulder
 - The average monthly usage (Dth) per residential customer for buildings located in the City and County of Denver
 - The average monthly usage (Dth) per commercial customer for buildings located in the City and County of Denver
- Does the Company collect and trend gas consumption for customers who install heat pumps as a part of the Company's beneficial electrification or clean heat programs? In addition to tracking gas sales for participating customers, is the Company able to calculate any changes in peak demand actually serving those specific customers? If not, is the Company capable of tracking this?
- The application form for new gas service titled Application for Gas and Electric Services and listed as being relevant for Colorado customers' requests detailed applicant building information including, the total gas load capacity (in BTU/hr), as well as the peak capacity for space heating, water heating, etc. Are the inputs from customers requesting new gas service regarding capacity recorded in any data management system?
 - If so, please provide data for each of the last 3 years on each of the following:
 - Average single family residential total gas load capacity (BTU/hr)
 - Average single family residential space heating gas load capacity (BTU/hr)
 - Average multifamily residential total gas load capacity (BTU/hr)
 - Average multifamily residential space heating gas load capacity (BTU/hr)
 - Average commercial total gas load capacity (BTU/hr)
 - Average commercial space heating gas load capacity (BTU/hr)
 - Total gas load capacity from all applications
 - If not, please respond to the possibility of the Company compiling and trending this data for new applications.

Questions for all Workshop Participants and other interested stakeholders or individuals:

- Please provide any data available, including from permitting agencies or rebate programs, with regard to:

- Year-over-year trend (for whatever time period is available) in number of installations of heat pumps vs natural gas furnaces/boilers for each of the following:
 - Existing residential buildings - single family
 - Existing residential buildings - multi-family
 - New residential buildings - single family
 - New residential buildings - multi-family
 - Existing commercial buildings
 - New commercial buildings
- If the above information is not currently available, please indicate if this is information that could be compiled in the future to assist in understanding trends in mechanical systems.
- Please identify if your entity has any available data, including from permitting agencies or rebate programs, about the backup source of heat (electric resistance, gas, none or other) and the equipment's peak capacity being utilized for projects with newly installed air source heat pumps. If data is available, please provide. If not, please indicate if this is information that could be solicited and compiled in the future to assist in understanding trends in mechanical systems.
- For entities associated with building performance standard programs - Do you expect buildings to provide advance notice of their intended changes to mechanical systems, including new mechanical system fuel type and backup fuel type? If not, please indicate if this information could be solicited and compiled in the future to assist in understanding upcoming trends in mechanical systems.
- Are there available data sources for observed reductions in gas capacity needs either in aggregate or by building-level associated with either building code changes or customer adoption of electrification measures?

Questions for CEO:

- The presentation at the July 18 workshop included slides showing the expected future changes to fuel breakdown (electricity and fossil gas) and the overall reduction in GHG emissions, which shows those originating from electricity vs fossil gas. Does CEO have the ability to generate a third chart showing the projection for sales of electric and sales of fossil gas, separately, for the time period shown, through 2030?
- CEO's information indicated that the state's building performance standard impacts roughly 8,300 buildings statewide. Does CEO have any additional information related to the geographic distribution of the 8,300 buildings? For example, it could be helpful to know how many are located within the largest municipalities in the state or where there are large geographic groupings of buildings subject to the regulation.