

Kaitlyn Peterson
Legislative Clerk
Subcommittee on Energy and Commerce
2125 Rayburn House Office Building
Washington DC, 20515

May 6, 2024

Dear Ms. Peterson,

Please find the responses of Mr. Hay to the supplemental questions from the Members of the House subcommittee on Energy, Climate, and Grid Security from Wednesday February 14, 2024 below.

The Honorable Debbie Lesko

1. Can you please elaborate on the significance of attributes that dispatchable resources like coal and gas provide the grid, such as capacity and energy during peak demand, ramping, operating reserves, frequency regulation, voltage control, system inertia for stability, resilience against disruptions, buffering against variable energy source, etc.?
 - a. Do you think that a mechanism put into place within the energy markets to compensate or ensure the availability of resources that possess such attributes would enhance grid reliability and affordability?

Dispatchability, the ability to produce energy on demand and at the amounts desired, is a crucial attribute for maintaining reliability. The specific grid services listed in the question are also key to maintaining grid reliability. While resources such as coal and gas have traditionally provided most or all of these attributes, many electric systems, including Colorado's, are finding that other resources are able to provide these attributes as well. For example, battery storage systems can provide these services and often at shorter timescales and with faster response than coal. At longer timescales, geothermal resources can provide many of the long-duration, ramping, and inertial attributes that shorter-duration resources may not be able to provide as cost-effectively.

Colorado is finding that all of these grid services are necessary for reliability, and has been exploring a technology-neutral approach to determining which resources might best serve these needs. The goal is to ensure that we have a grid that can meet customer and state needs in the most efficient way possible, without predetermining which resources those might be.



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Regarding mechanisms to ensure the availability of such resources, currently this happens through the rigorous electric resource planning process that takes place at our Public Utility Commission. In addition, Colorado is currently in the process of investigating and negotiating the structure of potential regional electric markets. Since reliability is a primary concern, we want to ensure that any market Colorado joins is set up to be stable and avoid availability constraints. We have not yet determined exactly what that will look like, but we will be continuing to work on this over the coming year.

2. At the state level you regulate with a tool called an Integrated Resource Plan or IRP. It requires a utility to look into the future and plan for grid reliability and affordability. Currently these RTOs/ISOs are not required to do this type of planning even though their territories span large regional areas of the US. Do you think it would be helpful for these RTOs/ISOs to provide FERC plans that are similar in scope to IRPs?

Colorado electric customers are currently served by investor-owned utilities, electric co-ops, and municipal utilities. All of these entities are required to undergo some level of resource planning with oversight from governing bodies. These categories of load-serving entities will continue to exist should they join an RTO/ISO and will continue to be obligated to carry out the resource planning process. While the RTO/ISO will need to forecast and plan for changes in the transmission resources that it controls, it would be duplicative for the RTO itself to carry out generation resource planning in addition to the IRP process carried out in each of its member utility organizations.

3. Should RTOs/ISOs have a similar policy such as “an obligation to serve”?

Pursuant to Colorado statute (§40-5-108, C.R.S.), utilities in Colorado that operate transmission are required to be part of an organized wholesale market by 2030 unless the Colorado Public Utilities Commission determines that an individual utility’s participation is not in the public interest. To support consideration of this obligation, Colorado law (§40-2.3-102, C.R.S.) required the Colorado Public Utilities Commission to open a proceeding to investigate the potential costs and benefits to electric utilities, other generators, and Colorado electric utility customers that would arise from electric utilities participating in an organized wholesale market, including potential advantages and disadvantages of these options issues impacting reliability, including commitment and dispatch of generation and real-time dispatch optimization of energy and ancillary services and reserve margin

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requirements. The resulting report identified significant concerns with shifting core aspects of electric utility regulation (involving new generator interconnection, transmission expansion, and resource adequacy) from state control to a regional processes due to concerns with governance issues, including the state’s ability to ensure that it will meet its clean energy and climate goals while maintaining system reliability.¹ The state Public Utilities Commission concluded that any determination that it is in the public interest to transfer functional control of Colorado’s electric utility transmission assets to a broader regional process would require consideration of those governance issues and certain other concerns in the context of a specific market opportunity.²

Subsequently, the Colorado Public Utilities Commission opened a rulemaking proceeding for transmission utilities that will address parameters for under which a utility would enter organized wholesale markets. (Proceeding No. 22R-0249E). While Colorado is determining how to regulate transmission utilities entering into a wholesale market, and because Colorado utilities are not part of an RTO/ISO currently, the Energy Office does not take a position in the question of what requirements an RTO/ISO should have.

4. Utility Commissions are responsible for assuring reliable utility service at fair, just, and reasonable rates. How do you consider factors like reliability and affordability when pursuing climate and emissions goals?
 - a. How do you reconcile these factors with state goals when they conflict?

Colorado’s transition to a lower-carbon electrical grid has focused on the three pillars of affordability, reliability, and pollution reduction. While reducing emissions, the state has been able to keep electrical rates below the national average.

In 2019 Colorado passed legislation requiring qualifying regulated electric utilities to present Clean Energy Plans (CEP) to reduce carbon emissions by 80% compared to a 2005 baseline by 2030 and achieve 100% clean energy by 2050.³

¹ Colorado Public Utilities Commission, [Colorado Transmission Coordination Act: Investigation of Wholesale Market Alternatives for the state of Colorado, §§ 40-2.3-101 to 102, C.R.S.](#) (Dec. 1, 2021).

² Colorado Public Utilities Commission, [Colorado Transmission Coordination Act: Investigation of Wholesale Market Alternatives for the state of Colorado, §§ 40-2.3-101 to 102, C.R.S.](#) (Dec. 1, 2021).

³ SB 19-236



In order to balance this environmental goal with affordability goals, the bill also implemented a cost cap on CEPs limiting customer bill impacts to a maximum of a 1.5% increase through 2030. This provision provides stability to customer bills and protects customers from unreasonable rate increases over the decade that these emissions goals are being pursued. Further, the statute requires the Commission to consider whether the CEP will result in a reasonable cost to customers on an NPV basis and authorizes the Commission to reject the plan if customer bill impacts are found to be unreasonable, similar to standards the Commission has long used to evaluate traditional electric resource plans.

A recent study conducted by the Colorado Energy Office found that the lowest cost pathway to meeting projected 2040 electric demand achieves approximately 97.7% reductions of in-state GHG emissions from a 2005 baseline.⁴ Essentially, the study found that adding significant amounts of low cost wind and solar, combined with battery storage, while maintaining gas generation as a reliability resource, minimizes costs to consumers for generation.

Colorado also has mechanisms to assess impacts of the electric system beyond the easily quantifiable values of reliability and affordability - such as jobs and wages, health impacts, preservation of Colorado's natural beauty and environmental resources, all of which have economic and quality of life impacts on Coloradans. To ensure a just transition for workers and communities that have supported the state's coal-fired plants, the CEP statute requires that any utility plan that includes a proposal for accelerated retirement of existing generation facilities include a workforce transition and community assistance plan (§ 40-2-125.5(4)(a)(VII), C.R.S.). This plan must assist utility workers impacted by the closure in finding new employment, preferably within the utility, and to pay local governments or school districts for any tax revenue that would be lost due to the closure. This measure helps ensure that Colorado's clean energy transition does not cause adverse impacts to the employment or funding of local communities.

Colorado's electric resource planning process, which now includes clean energy planning requirements, evaluates future energy needs over a 20 year period with a focus on acquiring needed resources of the 6 to 10 year period following the filing of the plan. Consistent with its missions to ensure "that the people of Colorado receive safe, reliable, and reasonably priced service consistent with

⁴ Pathways to Deep Decarbonization in Colorado's Electric Sector by 2040; available at <https://drive.google.com/drive/folders/11fU16ZRAQFMnJfer2pRVp2WdF6Wzwssr>

the economic, environmental, and social values of our state,” the Public Utilities Commission evaluates a range of portfolios that meet energy need to determine the portfolio that provides the best combination of cost, reliability, and pollution reductions.

5. Although the states set individual climate and emissions goals, actions by one state could affect other states due to the interconnected nature of the electric grid and the natural gas pipeline system.
 - a. How are individual states’ energy policies affecting regional or national reliability? Resource adequacy?
 - b. How are your Commissions managing divergent state approaches to energy policy?

(a) In Colorado and many similar states that have a regulated utility model, electric utilities have the obligation to ensure the reliability of their own electric system. Most RTOs/ISOs have policies in place to ensure that member utilities are prevented from negatively impacting the reliability of the interconnected grid. For example, one such policy is the common requirement that member utilities must prove that they have sufficient resources in a given time period to cover a reserve margin above their expected load. Only once the utility has proven that they have sufficient resources to maintain reliability even in the event of a contingency event are they allowed to remain in the RTO/ISO for that time period. This mechanism prevents a lack of reliability on the part of one utility from affecting others. Additionally, utilities must prove the availability of reliable resources to the standard of the RTO/ISO. A utility that pursues renewable energy resources, for example, is typically not able to claim reliability contributions from those resources in excess of what the RTO/ISO has determined for that particular resource. In other words, a state can not determine its own reliability metrics when joining an RTO/ISO. Those metrics are determined by the RTO and apply to all member utilities equally, further preventing the resource choices of one particular utility from negatively impacting neighboring utilities.

While Colorado might choose to pursue certain climate goals, it certainly is not doing so at the expense of neighboring regions. Colorado can choose to deploy electric resources that meet its own goals, but in doing so, it will not reduce its neighboring states’ ability to build and supply their own electric resources, thus preserving those states’ abilities to pursue their own reliability needs. By contrast, no mechanism exists to confine the impacts of air pollution and greenhouse gas emissions from states that do not choose to decarbonize their electricity generation.

(b) Colorado Senate bill 21-072 requires all Colorado Transmission utilities to join an Organized Wholesale Market (OWM) on or before January 1, 2030. The new statute (§40-5-108, C.R.S.) defines ten characteristics of a qualifying RTO and makes clear that an RTO or ISO must meet all ten requirements in order to be identified as a qualified OWM. The Public Utilities Commission has opened a rulemaking to specify filing requirements for utilities seeking approval to join an OWM and reporting requirements regarding utilities' plans, commitments, and actual participation in these markets. The Commission's rulemaking seeks to ensure it is sufficiently informed of the impacts of potential market participation on a regulated utility's ability to adequately and reliably serve its Colorado customers, charge just and reasonable rates, meet applicable emission reduction requirements and clean energy targets, and remain responsive to State concerns and regulation. As such, the rulemaking process by the Colorado PUC will help ensure that our state goals are met in the event of joining an RTO without influencing what approaches may be taken by other states in their choice of potentially joining an RTO.

6. EPA's power plant proposal effectively requires carbon capture and storage (CCS) or clean hydrogen, two commercially unproven technologies, to reduce carbon emissions by 90%. Given that these technologies are unproven, can you discuss the potential reliability problems EPA's proposal would create for Colorado?

Colorado state agencies are still reviewing the recently released EPA power plant rules, but the Energy Office does not believe that the EPA rules would have any negative impact on electricity reliability in Colorado. To help ensure reliability of the electrical grid Colorado adopted initial legislation in 2019,⁵ subsequently expanded in other bills,⁶ that created a clean energy planning (CEP) framework. Under the CEP framework, certain utilities in Colorado are required to have approved electric resource plans that demonstrate how the utility will reduce greenhouse gas emissions at least 80% by 2030 from a 2005 baseline consistent with maintaining reliability and affordability. The state's Air Pollution Control Division (Division) has created a workbook that utilities are required to complete and to submit to the Division for verification of the emissions reductions. Under the CEP approved plans, roughly 3,500 megawatts of coal-fired capacity at 10 coal-fired units is scheduled to be retired no later

⁵ Senate Bill 19-236.

⁶ House Bill 19-1261 and House Bill 21-1266.





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than January 1, 2031.⁷ ERP and CEP proceedings help Colorado and its utilities to plan for these retirements. For example, Colorado Springs Utilities recently closed the Martin Drake plant (207 MW) and replaced it with gas-fired generation. Its CEP also approved the closure of the Ray Nixon coal-fired power plant (207 MW) by the end of 2029. Platte River Power Authority has adopted a CEP that includes the retirement of the Rawhide facility (294 MW) by no later than 2030 as part of a plan to achieve 100% emission free electricity by 2030. The Public Utilities Commission approved the closure of Comanche unit 3 (856 MW), Xcel Energy's last remaining coal plant, by no later than January 1, 2031, 40 years ahead of its initial, planned retirement. Tri-State Electric Generation and Transmission, Inc. just filed an ERP, which requests that the PUC approve the January 1, 2028, retirement date for their remaining coal plant, Craig Unit 3 (535 MW).⁸

Analysis done by the Office projects no negative impact on the reliability of Colorado's electric grid from the currently scheduled plant retirements or from the EPA's proposed clean power regulations. Analysis done by third party entities such as Analysis Group⁹ and Energy Innovations¹⁰ have also concluded that compliance with the EPA rule should not result in reliability issues.

The EPA rule provides several reliability contingencies, including additional time for compliance in certain circumstances, emissions trading and averaging, and mass-based compliance equivalency. The rule also has a short term mechanism to ensure reliability in emergencies, and a reliability assurance mechanism for units with planned retirement. Although Colorado does not foresee facing any reliability issues, these contingencies would ensure reliability in any unanticipated scenario.

Our analysis also shows that the technologies proposed in the EPA rules will be important to achieving a lower cost pathway to deep decarbonization of the electrical grid. In a recent report titled Pathways to Deep Decarbonization in

⁷ Mark Jaffe & Michael Booth, *How is Colorado doing in shutting down coal power plants?*, COLORADO SUN (May 15, 2023), <https://coloradosun.com/2023/05/15/colorado-coal-shut-down-new-epa-rules/>.

⁸ Verified APPLICATION OF Tri-State Generation and Transmission, Inc. for Approval of Its 2023 Electric Resource Plan. <https://drive.google.com/drive/folders/1qjSAyQF4wK7uyQQp8zSxwVUtMh9oYQ3g>

⁹ EPA's Proposed Emissions Regulation Will Not Threaten Electric System Reliability if Risks Are Addressed Appropriately, According to Senior Advisor Susan Tierney in Independent Study - <https://www.analysisgroup.com/news-and-events/news/epas-proposed-emissions-regulation-will-not-threaten-electric-system-reliability-if-risks-are-addressed-appropriately-according-to-senior-advisor-susan-tierney-in-independent-study/>

¹⁰ Maintaining A Reliable Grid Under EPA's Proposed 111 Rules Restricting Power Plant Emissions - <https://energyinnovation.org/publication/maintaining-a-reliable-grid-under-epas-proposed-111-rules-restricting-power-plant-emissions/>



Colorado’s Electric Sector by 2040, the Office evaluated several different paths to deep emissions reductions.¹¹ The lowest cost pathway to a 100% reduction in GHG emissions included the addition of more than 6,000 MW of hydrogen (both new and retrofit). While this scenario accounted for a 50% growth in electricity demand through 2040, it still met a reliability requirement standard of a loss of load probability of less than 1 day in 10 years. Additionally, in this scenario wind and solar are the primary energy sources, with all coal plants in Colorado scheduled to retire by the end of 2030. Modeling indicates that the capacity factor at gas plants will decline rapidly after 2030, below key thresholds in the EPA rule. In 2023 Colorado adopted HB 23-1281, which creates regulatory pathways at the Public Utility Commission for consideration and approval of hydrogen projects by public utilities.

In its recently filed ERP, which is currently before the Commission, Tri-State Generation and transmission is seeking approval for a 290 MW natural gas combined cycle resource to be brought online in 2028. Tri-State’s plan calls for adding carbon capture and sequestration (“CCS”) to the combined cycle resource in 2031. Colorado has taken significant steps to enable CCS, including legislative authorization in 2023 to the state Energy and Carbon Management Commission to seek primacy for regulation of carbon dioxide injection wells, and legislation that is under consideration now to clarify pore space ownership and unitization. Colorado’s state land board has also begun leasing pre space for carbon sequestration. These actions have prepared Colorado well for the inclusion of CCS as a pathway to meeting EPA power sector rules.

Regarding the reliability of emerging energy technologies, Colorado has a history of successfully investing in developing energy resources that yield benefits in reliability, affordability, and emissions reductions. As an example, Colorado’s development of wind technology over the past 20+ years has helped arrive at the current situation where wind has lowered the average \$/MWh cost of Colorado electricity and simultaneously provided over 28% of the state’s total energy in 2022, helping keep Colorado in the Top 10 for states with lowest average electricity bills. This progress was buoyed by our state’s IRP process, which ensured a careful and deliberate deployment process that cultivated the maturity of wind technology without sacrificing our state’s reliability standards.

With the positive experience Colorado has had from fostering emerging technologies, our state is ready to explore avenues to developing technologies

¹¹ Pathways to Deep Decarbonization in Colorado’s Electric Sector by 2040; available at <https://drive.google.com/drive/folders/11fU16ZRAQFMnJfer2pRVp2WdF6Wzwssr>





like CCS and hydrogen to meet the EPA’s goals, while ensuring that these approaches never reduce the reliable electricity supply that Coloradans have come to rely on.

Respectfully submitted by:

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