STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Petition of Green Mountain Power for approval of its new multi-year regulation plan pursuant to 30 V.S.A. §§ 209, 218, and 218d.	)))	Case No. 25-1955-PET
Tariff filing of Green Mountain Power Corporation requesting a change in rates, effective October 1, 2026	)))	Case No. 26-0096-TF

REBUTTAL TESTIMONY OF ANDY EIDEN ON BEHALF OF GREEN MOUNTAIN POWER

May 27, 2026

Summary of Testimony

Mr. Eiden of Current Energy Group ("CEG") presents a revised benefit-cost analysis ("BCA") that he completed on behalf of Green Mountain Power ("GMP") for GMP's focused resiliency work for Fiscal Year 2027 ("FY27"). Mr. Eiden responds to the Department of Public Service's testimony regarding his initial BCA and describes how he incorporated the Department's recommendations into this revised BCA that continues to support the full Resiliency Project portfolio.

Exhibit List

Exhibit GMP-AE-3	Revised Resilience BCA Model
Exhibit GMP-AE-4	Rhizome Risk and Vulnerability Analysis
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REBUTTAL TESTIMONY
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I. Introduction

Q1. Please state your name and occupation. Please state your name, affiliation, and business address.

A1. My name is Andy Eiden, and I am Senior Manager of Distribution System Planning and distributed energy resource ("DER") Integration at Current Energy Group, located at 4764 E Sunrise Drive, Unit #508, Tucson, AZ 85718.

Q2. On whose behalf are you testifying?

A2. I am submitting this testimony on behalf of Green Mountain Power ("GMP") in this proceeding.

Q3. Have you previously submitted testimony in this proceeding?

A3. Yes, I filed direct prefiled testimony on January 16th, 2026, which provided a benefit-cost analysis ("BCA") for GMP's resiliency work planned for Fiscal Year 2027 ("FY27").

Q4. What is the purpose of your Rebuttal Testimony?

A4. My rebuttal testimony addresses methodological critiques of the BCA raised by Witnesses TJ Poor and Shawn Enterline on behalf of the Vermont Department of Public Service ("Department" or "DPS"). The Department's discovery questions and recommendations in testimony provided useful opportunities to clarify or update the BCA, and as a result I implemented several modeling updates to the BCA methodology. I

introduce this updated model as **Exhibit GMP-AE-3**, which includes the following key updates among other corrections identified during discovery and in the process of revising the model:

Results are presented from a Utility Cost Test ("UCT") perspective to complement the primary Total Resource Cost Test ("TRC") perspective described in my direct testimony.

- Climate-informed risk and vulnerability assessments were developed by Rhizome Consulting (Rhizome), which uses machine learning models to extrapolate climate risk across the utility system. These results are directly incorporated as forecasts of future storm impacts and confirm my initial storm cost assumptions.
- A consistent treatment of discount rate for costs and benefits, applying GMP's weighted average cost of capital ("WACC") consistent with the Department's model revisions.

These updates are described in greater detail below in testimony, which I conclude by explaining how the model continues to support my opinion that GMP's planned resilience investments are cost-effective and economical.

Q5. How is your testimony organized?

A5. I begin with an overview of the BCA model and the Department's recommendations, and provide a summary of my response to those recommendations in Section II. In Section III, I provide detailed descriptions of each update I have made to the model and introduce Rhizome's risk and vulnerability assessment work. In Section IV, I present updated modeling results across multiple scenarios, including UCT and TRC perspectives, risk

and vulnerability assessment, a revised discount rate, and feeder-level results, before I conclude my testimony.

II. Response to Department Recommendations

Q6. Please summarize the Resilience BCA model you filed in direct testimony.

A6. The Resilience BCA model that I filed in direct testimony follows a structured, quantitative cost-benefit framework guided by industry best practices for evaluating and assessing utility resilience investments, such as EPRI's ClimateREADi framework and Sandia National Laboratory's guidance document.[1] The initial BCA model captures the costs and benefits associated with GMP's FY27 resilience projects (the "Mitigation Scenario") that are net of the expected outcomes of a reasonable counterfactual Baseline Scenario, which is based on the expected level of resilience spending that would occur without any accelerated Resilience Projects. I described the detailed methodology and source data for the BCA model throughout my Direct Testimony.[2]

The Resilience BCA model quantifies how the FY27 resilience mitigations (overhead ("OH") spacer cable and underground cable-in-conduit ("UG CIC")) reduce future outage frequency. The model uses actual historical outage data and applies effectiveness and applicability factors to estimate avoided outages. The model then applies a Vermont-specific estimate of the customer value of avoiding an interruption as determined by the United States Department of Energy's interruption cost estimator ("ICE") Calculator, in addition to the utility system benefits of the FY27 projects, such as

[1] *See* Prefiled Direct Testimony of Andy Eiden, at 34.
[2] *Id.,* at 40-62.

reduced outage restoration costs, reduced operations and maintenance costs, and reduced line losses.

All cost and benefit streams are calculated annually over the full asset life, escalated and adjusted as needed to account for differences in depreciation and book life, and then discounted to present value to enable comparison. The model aggregates these annual present value streams by project type and calculates the net incremental costs and benefits of the Mitigation Scenario relative to the Baseline Scenario that inform the final benefit-cost ratios ("BCRs"), which were broken down by mitigation type in the initial BCA.

Q7. Please summarize DPS's response to the Resilience BCA.

A7. DPS noted that the Resilience BCA represented a significant step forward for assessing GMP's resilience investments, noting that the level of detail and analysis included was unprecedented in terms of Vermont distribution utilities.[3] With respect to the inclusion of a quantified value to measure the improvement in customer resilience resulting from GMP's FY27 Resilience Projects, DPS notes that "[T]his inclusion provides substantially more information for the Commission's consideration than ever before, including in Case No. 23-3501-PET, providing a new data point to illuminate impacts to different groups of beneficiaries."[4] The Department's primary critique is that the BCA used a TRC test perspective to evaluate Resilience Projects and lacks treatment of the investment under a UCT perspective, which omits the value of avoided outages for customers. DPS states

[3] Case No. 26-0096-TF, Prefiled Testimony of Walter (TJ) Poor and Shawn Enterline, at 8.
[4] *Id.,* at 9.

that TRC results "must be considered in tandem with a UCT in order to help regulators determine how much money certain ratepayers should pay for a benefit that does not necessarily accrue to them."[5]

The Department also identified areas they believe would aid the Department and Commission in assessing the results of the BCA. These fall into two categories. In the first, DPS identifies three "feasible enhancements" of the model which can "improve planning and likely outcomes for ratepayers."[6] These enhancements relate to challenges inherent in modeling future risk and uncertainty, and include the following:[7]

Risk and vulnerability analyses to inform the BCA, reflecting scenarios of future risk stemming from climate projections and their impacts on storm frequency, duration, severity, and cost. DPS states that including this type of quantifiable information would improve UCT and TRC analyses and also help identify infrastructure most likely to be impacted by storms.

- Scenario analysis to identify the potential impact of investments under different possible future conditions.
- Feeder-specific BCA results that can help to prioritize investments.

The second category offers one "immediate" improvement to the BCA model to improve the interpretation of the BCA results. This is related to the use of a consistent discount rate across costs and benefits included in the model notwithstanding the discount rate that might typically be applied to a value in isolation.

[5] *Id.,* at 10.
[6] *Id.,* at 10.
[7] *Id.,* at 10-11.

Q8. Did DPS present an alternative analysis and recommendation?

A8. Yes. DPS submitted Exh. DPS-WP-SE-5 that showed cost-effectiveness results using a UCT test perspective, calculated by removing the value of resilience. DPS also submitted Exh. DPS-WP-SE-6 that showed the mitigation cost and the cost per customer for GMP's worst-performing circuits based on data from GMP's annual reliability reporting and responses provided in discovery. DPS then recommends an alternative resilience investment level of $28.3 million in FY27, which represents the investment amount identified for the two worst-performing circuits (CH-G11 and DM-G6).[8] DPS recommends holding that level of investment flat over the entire four-year MYRP, for a total resilience investment level of $113.2 million.[9]

Q9. Before addressing the Department's recommended alternative level of investment, how do you respond to the Department's four recommended enhancements?

A9. In general, I agree that planning for uncertain climate risks presents a significant challenge to both utility planners and regulators. In this regard, greater treatment of risk and uncertainty to the extent it is reasonably feasible to do so will most certainly aid in decision making, though all models must make reasonable choices on how best to address complexity and uncertainty given the scope and purpose of the work. The feasible enhancements the Department describes cover a wide array of highly technical ground, much of which is still emerging across the industry and not yet widely adopted. As such, I view many of these recommendations as identifying areas of ongoing improvement that

[8] *Id.,* at 16-17.
[9] *Id.*

can be made with future iterations, especially as the resilience docket 25-0339-PET continues to progress and additional experience is gained through existing resilience investments. Nevertheless, as I introduced above, GMP has worked to address each of the DPS recommendations with the best available information, as reflected in the updated model submitted with my testimony.

Q10. Please summarize the updates you made to the model in filing your rebuttal testimony in this case.

A10. I have updated the model to reflect several methodology improvements, each described in greater detail in Section III below. First, although the previous model transparently showed the benefits and costs that would accrue under a UCT test, I have refined how the model presents its conclusions to incorporate a UCT perspective for all mitigation types and scenarios. I then incorporate elements of each of DPS's four recommendations: I incorporate additional risk and uncertainty modeling through the use of Rhizome's climate-informed storm forecasts, which also includes scenario analysis of several climate models; I present feeder-level results for additional granularity; and I standardize the discount rate across all model runs, including both UCT/TRC tests and portfolio and feeder-level scenarios.

Q11. How do you respond to the Department's overall recommendation for Resilience Investment levels?

A11. I appreciate the Department's recognition of the value of resiliency work, and that this value extends beyond the narrow context of a UCT test.[10] As noted by Mr. Burke, who also addresses the Department's recommendation, the dispute in this case is not about the need for resilience investments, but the pace and scale of the investment. These questions are what my BCA was developed to help evaluate, consistent with emerging best practices nationwide, because it analyzes the benefit of accelerating work over a baseline investment. In contrast, the Department presents no quantitative analysis or engagement with the resilience valuation methods underlying my BCA, including the nationally applied ICE 2.0 Calculator tool. Instead, the DPS recommendation is based on a "qualitative assessment" including a number of economic factors. Mr. Burke responds to these qualitative factors and the Department's overall balancing of resilience work; I note here only that the DPS recommendation is unsupported by any quantitative rigor.

In addition, the Department's view over-emphasizes the UCT perspective, which is a narrow and unreasonably restrictive view of resilience investment planning. Though the Department acknowledges that projects do not need to "pass" a UCT screen in order to justify investment,[11] DPS still essentially discounts the extensive TRC analysis of these resilience projects. The Department's position is based on a constrained view that resilience proposals allegedly "lack clear beneficial returns for ratepayers" but this

10 See prefiled direct testimony of Enterline and Poor at 18 (observing that resilience investments should not be viewed solely on whether they "pass" a UCT).
11 *Id.*.

position focuses exclusively on the UCT test, ignoring the TRC analysis, which use the exact ICE methodology the Department previously requested for considering important resilience benefits of this type of work.[12] As a result, the DPS recommendation for limited investment is more akin to status quo reliability-based investment planning, which does not value the significant resilience benefits for customers who are currently experiencing extensive outages. As discussed further below and in Mr. Burke's testimony, that narrow proposal will significantly limit the number of customers who could benefit from this work and will make it more difficult to deliver important additional resilience benefits that would otherwise accrue to GMP customers under GMP's proposal.

Q12. How should the Commission view the UCT when evaluating the costs and benefits of resilience investments?

A12. I have provided a UCT to accompany the TRC results in order to provide DPS and the Commission with a more complete picture of the costs and benefits of GMP's FY27 Resilience Projects. With this information, stakeholders can assess those costs and benefits that accrue narrowly to the utility system, as in the case of the UCT, together with the full range of resilience benefits to GMP customers outlined in our TRC analysis. By construction, the UCT excludes benefits that accrue directly to customers. While this can be useful in informing decision making, it is not a reasonable lens to rely on for evaluating resilience investments because the *central purpose* of a resilience investment

[12] *Id.,* at 15-16.

is to deliver a benefit—avoided outages—to the customers served by the affected infrastructure. Excluding that benefit from the primary test would systematically conclude that resilience investments are uneconomic, regardless of how much outage exposure they eliminate, or their benefits to improved outcomes for customers and society.

Under a UCT standard, very few, if any, projects would score above a 1.0 BCR. This is contrary to the regulatory perspective typically applied to resilience investments, which is to explicitly recognize that some near-term costs are justifiable when they can provide meaningful protection from severe weather events and increasing outage risk. This broader conception is in line with the Commission's directive in Case No. 23-3501-PET that ratepayers "derive meaningful benefits" from resilience investments, a sentiment that was not limited to a narrow focus on utility rate impacts.[13] For instance, the Commission found that the "immediate resiliency benefits" accruing to a significant number of GMP customers advanced the Commission's "desired outcome for [that] case."[14] The TRC, with the value of resilience included, is the only test between the two that measures whether those meaningful benefits are being delivered. The UCT, by excluding this consideration, only measures whether resilience investments would increase or decrease utility revenue requirements based on a comparison of utility costs and utility benefits.

[13] ZOI Order at 24.
[14] *Id.,* at 23.

The National Standard Practice Manual, which DPS relies on in its testimony, expressly cautions against selecting a primary cost test that omits relevant policy goals, and recommends that jurisdictions choose the test that aligns best with their applicable policy framework.[15] For resilience, where the policy objective is reducing customer exposure to extreme weather and outage risk, that alignment points to the TRC, not the UCT. Using a test that cannot capture the policy objective as the gating criterion would create a direct conflict between BCA outcomes and the statutory and regulatory mandates under 30 V.S.A. § 219 and the Commission's resilience orders. Moreover, characterizing the TRC's customer resilience values as merely "societal" benefits misapprehends their nature: these are direct, quantifiable benefits to the GMP customers served by the upgraded infrastructure. These customers are those that are experiencing the worst reliability outcomes and who have paid in rates for reliability projects throughout the system, as have all customers. Imposing a pure UCT requirement on projects in these areas risks further perpetuating existing discrepancies in service levels between customers and would significantly discourage necessary resilience investments in rural areas of Vermont that need it the most.

III. BCA Model Updates and Corrections

Q13. What is the purpose of this section of your testimony?

A13. This section describes in detail the methodology changes identified in Section II above in more detail.

15 National Energy Screening Project, *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources* (2026), at 4-2. Available at: https://naseo.org/Data/Sites/1/media/tknaseo/nspm-main-2026-final.pdf

Modeling reliability impacts of increasing future storm frequency under worsening climate conditions

Q14. In Direct Testimony, how did your Resiliency BCA model account for reliability impacts of increasing future storm frequency?

A14. I modeled increasing storm costs in my direct testimony by first calculating GMPs' average historical storm costs from FY15 through FY24, and then adjusted the dollar years to 2028 to match the first year of the BCA modeling period.[16] Next, I escalated the average annual storm costs by a linear trend factor, equal to the slope over the same historical baseline period, for each of the first 10 years of the analysis period. I applied GMP's annual inflation factor of 2.04 percent to each year of the BCA analysis period. Because I only escalated the average annual storm costs for the first 10 years of the study period, this value was held constant for the remainder of the useful life of the specific asset, impacted only by inflation, which as noted previously was a conservative approach.

Q15. Have you made any changes to how storm impacts are modeled in this update?

A15. Yes. Since filing my direct testimony, GMP contracted with Rhizome to further inform GMP's resilience planning efforts with additional predictive analytics regarding future expected outage and storm occurrences resulting from climate change. I have reviewed this study and incorporated the analysis into my model.

[16] See pages 44-45 of my Direct Testimony for more detail on how I modeled future storm outage costs.

Q16. Can you describe the Rhizome study and its applicability to the Resilience BCA modeling methodology further?

A16. The Rhizome study uses accepted methodologies to predict future storm occurrences and outage probabilities to a specific distribution system under a range of projected future climate scenarios. The study employs detailed storm and outage prediction models trained on actual storm and outage data and their accompanying weather characteristics. Further, Rhizome tested model predictions against out-of-sample time periods by withholding known data points to evaluate model accuracy and predictive power. The quantitative approach to projecting changes in future storms and outages was data-driven and supported by rigorous model validation steps, increasing confidence in the results.

Overall, the Rhizome methodology represents an improvement over the simplified but conservative linear trend methodology that I used to develop estimated storm cost reduction estimates in the initial BCA. It also broadly confirms our prior analysis, and while the method I utilized in my previous analysis is still valid and useful, the analysis provided by Rhizome presents a more detailed evaluation of likely future storm scenarios and adds further helpful information to evaluate this resilience portfolio. By accounting for and training on a range of physical characteristics across GMP's distribution grid, the prediction model also incorporates system vulnerability to various weather types in its predictions. I therefore have incorporated the Rhizome modeling outputs as a new input to the revised BCA model. I provide the full Rhizome study as Exh. GMP-AE-4.

Q17. Can you elaborate on the two models Rhizome developed that you incorporated into the updated BCA model?

A17. Yes, the two models made use of a consistent set of climate-related data covering observed historical data from 1980 to 2026, and projected climate data from a range of sources, looking at various scenarios for future climate impacts. From this core base, Rhizome developed the following models:

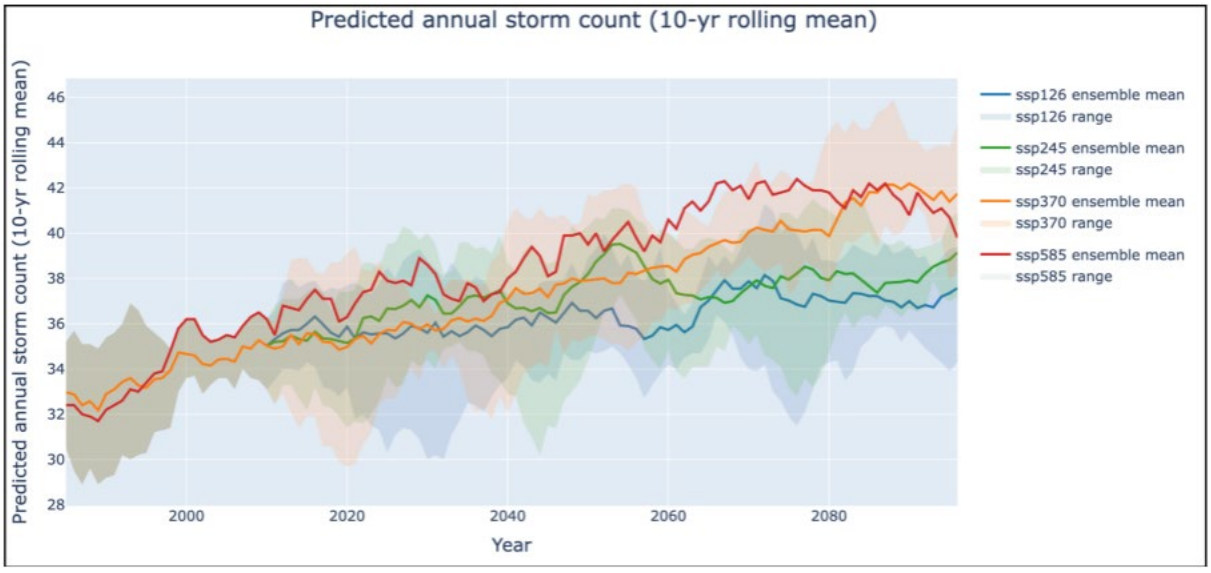
- **Outage model** that forecasts changes in annual outages based on input data covering historical outages, asset type and age, land characteristics associated with the tree canopy, and various weather-related variables such as temperature, precipitation, and wind speed.
- **Storm model** that predicts future storms based on forecasted climate data, based on input data covering historical weather, storm severity, and storm type. Note that Rhizome's storm model also forecasts for days that share characteristics with historical storm days but are not classified as Major or Minor storms.

Q18. What are the results of Rhizome's analysis of historical and forecasted storm occurrences?

A18. Rhizome's analysis tracks the significant increase in historical storm activity in Vermont over the observed period of 1980 to 2026, and a continuing increase out through 2100 as a result of climate change. Climate forecasts are based on four Shared Socioeconomic Pathways (SSPs), which are standardized global emissions and development scenarios adopted by the Intergovernmental Panel on Climate Change ("IPCC") for its Sixth Assessment Report. SSP1-2.6 represents an optimistic case with rapid global

decarbonization and strong climate cooperation, and SSP5-8.5 is an upper bound based on rapid fossil-driven growth and a tripling of emissions by 2075. Exh. GMP-AE-4 presents the full methodology used in the Rhizome study. Figure AE-1 below shows the mean five-year rolling average of storm occurrences for each of the four climate scenarios studied (shown as solid lines) and the range of potential impacts (shown as shaded areas).

Figure AE-1: Rhizome predicted annual storm counts by future climate scenario



Q19. Please explain any changes you implemented in the Rebuttal BCA methodology to incorporate the Rhizome study results.

A19. Rhizome's methodology captures the underlying relationship between historical observed outages and multiple weather and geographic variables, such as wind speed, temperature, precipitation, vegetation canopy cover, and more. Therefore, Rhizome's model captures storm events that have similar impacts to the Major and Minor storm categorizations defined in Rule 4.900, but do not reach the threshold to be so classified. In order to

incorporate these additional "storm-like" events into the model, I first calibrated the Major storms to a range of future expected values based on the past observed events and then assigned all remaining storms to the Minor Storm category. I then developed per-mile average costs of Major and Minor storms based on historical GMP data[17] and applied these to the Baseline and Mitigation Scenarios according to how many line miles were treated in a given year versus left untreated (for the Baseline Scenario). This also involved reworking my BCA model framework for the Baseline Scenario to capture varying annual storm costs through the end of the study period. In making these changes to the Baseline Scenario model framework, I also updated the other costs and benefits, such as O&M costs and feeder backup benefits, to accommodate the more granular annual storm costs estimates. Capturing Major and Minor storm costs in this way and applying them to discrete estimates of future expected storm occurrences under the influence of changing climate scenarios represents a more robust and detailed forecast than the straight-line estimates used in my direct testimony.

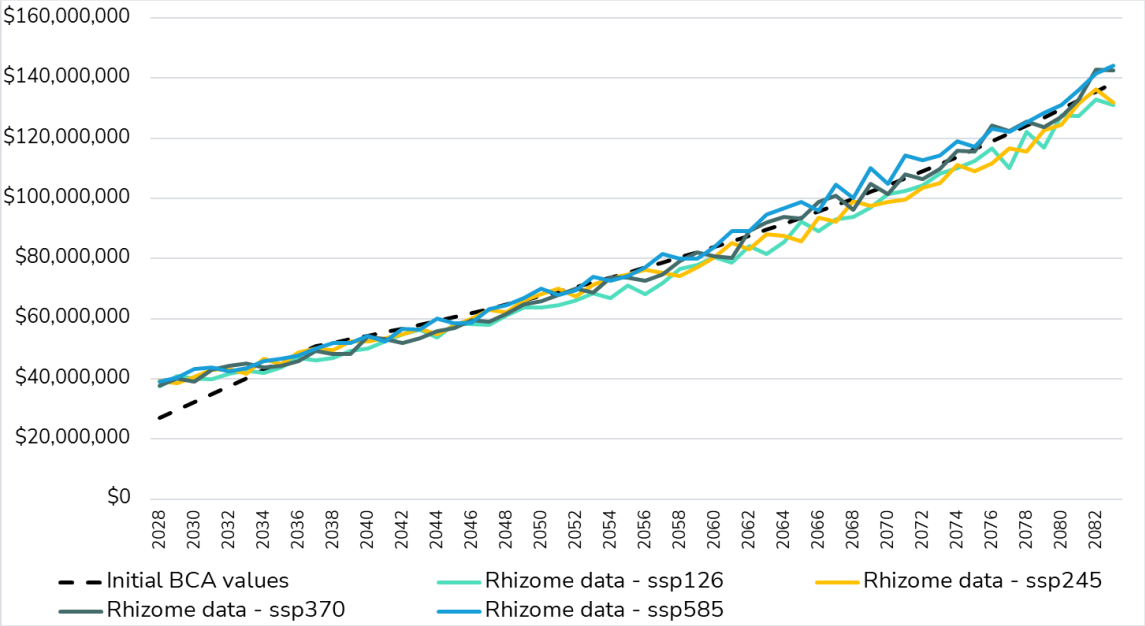
Q20. How does the updated storm cost modeling compare to the values used in the initial Resilience BCA model?

A20. The initial method of forecasting future escalating storm costs compares well with the updated storm cost modeling based on inputs from Rhizome's future climate risk modeling. Figure AE-2 shows the annual total storm outage costs across GMP's entire system that were developed for input to the initial Resilience BCA model and those

[17] In the Resilience BCA submitted with my Direct Testimony, I did not attempt to separate Major and Minor storm costs. *See* Prefiled Direct Testimony of Andy Eiden, at 40, footnote 31.

developed based on the Rhizome data. You can see that in the near-term years the updated data forecasts slightly higher storm-related costs, and trends closely to the previous method for the remainder of the BCA evaluation period.

Figure AE-2: Comparison of annual system-wide storm costs used in initial BCA modeling with updated storm cost projections from Rhizome storm modeling data



In order to translate the annual storm costs shown above into the model, they are first translated to a per-mile basis and then applied to the specific FY27 Resilience Projects based on the number of miles treated for each. Finally, the net benefits are computed by subtracting the storm costs in the Mitigation Scenario from the Baseline Scenario.

Q21. What are your conclusions about GMP's updated climate modeling reflected in the Rhizome data?

A21. While the overall change to the BCA inputs is small, updating the Rebuttal BCA model with the Rhizome storm prediction results provides several key benefits that will enhance

GMP's planning capability and add information for stakeholders to consider. The additional rigor around quantifying the uncertainty in future climate-driven events such as increasing storms and outages provides increased information on possible future outcomes and confidence in the results. By providing four climate scenarios for comparison—in addition to employing a machine-learning model trained on a high volume of climate data—the Rhizome study also addresses the Department's recommendation to consider scenario analysis. As can be seen in Figure AE-2 above, even across a wide range of potential climate outcomes reflected in the study, storm costs are expected to increase at a similar pace on average over the life of these investments.

Effectiveness Score Modeling

Q22. The Department also suggested future models could consider further sensitivity analysis on the effectiveness score for proposed resilience work. How did you address this recommendation?

A22. The effectiveness scores for the proposed resilience treatments can be modified in our BCA, however real-world results from GMP's existing resilience work confirm that our modeled effectiveness scores are reasonable, if not conservative, so we have not made further adjustments at this time. These variables do not appear to be subject to significant material variation and are supported by GMP field experience. I also note that GMP has proposed a performance metric related to resilience work which will impose financial penalties to guarantee performance for customers.

Aligning discount rate assumptions

Q23. Have you made any adjustments to the discount rates used in your Model?

A23. Yes, although the hybrid discount rate approach used in our initial analysis is appropriate and supported by best practices, as a further sensitivity test, and to be responsive to the DPS's recommendation, I implemented a consistent discount rate across all costs and benefits for each of the UCT and TRC perspectives, using the WACC for all costs and benefits as the Department did in Exh. DPS-WP-SE-5. The WACC was used as a discount rate for the TRC as well as the UCT. In the TRC, use of the WACC is a conservative approach in that it applies a higher discount rate to these long-lived investments and discounts the future benefits greater than in the hybrid approach I used in the initial testimony, or as compared to full societal discount rate scenario. A lower societal discount rate approach was also not used in the TRC because it discounts the Baseline Scenario less than the escalation of future costs, resulting in negative values that skew interpretation of the resultant BCR. As described below, this modification still results in a positive BCA under the TRC approach.

Crew worker and public safety benefits are potentially large and meaningful, and should not be ignored

Q24. Have you developed any additional benefits to include in the updated model beyond the Department's recommendations?

A24. Yes. In my direct testimony, I identified additional qualitative values that could be included in future analysis and that were additional to my initial, conservative analysis. One of these areas of significant additional value is GMP crew and public safety improvements resulting from hardened lines, which I understand is critically important to

GMP even as a qualitative factor. In developing the UCT for the updated Rebuttal BCA model, I developed an additional model input variable meant to capture the potential benefits from improved worker safety resulting from reduced exposure to hazards that result from the specific mitigations of installing overhead spacer cable and undergrounding.

Q25. Why is it necessary to include safety values in this analysis?

A25. Line upgrades provide real, measurable safety benefits to the utility system by decreasing exposure to utility workers and the related medical or insurance costs that would otherwise be passed onto customers, and also to society through increased customer safety.[18] I include this value to reflect the BCA principle of symmetry, which states that non-energy impacts should be included in the BCA, even if they are hard to quantify.[19] Indeed, safety can be particularly difficult to quantify—and no value fully represents the qualitative impact and importance of safety—so I have developed a reasonable proxy value based on existing public data. Workers face reduced exposure to hazardous maintenance conditions, especially during extreme winter storms, and the public faces reduced risk of contact with energized lines. Quantifying these benefits improves the analysis by capturing a more complete picture of the true value of these infrastructure investments.

[18] Jennifer Kallay et al., *Application of a Standard Approach to Benefit-Cost Analysis for Electric Grid Resilience Investments,* Sandia National Laboratories, Report, (May 2021), https://www.osti.gov/servlets/purl/1821803. (Hereinafter "the Sandia BCA Report"), at 30.
[19] National Energy Screening Project. *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*, (August 2020), available for download at: https://naseo.org/nesp/nspm.

Q26. How did you estimate the value of safety for the purposes of this analysis?

A26. I estimated values of improved safety outcomes for both project types in GMP's FY27 Resilience Projects portfolio: overhead ("OH") spacer cable and underground ("UG") cable in conduit ("CIC"). I quantified both avoided worker injuries and fatalities that would apply under the UCT perspective, as well as avoided public injuries and fatalities that would apply under the TRC perspective. The full derivation of the input value, as well as sources relied upon in the calculation, is provided as Exhibit GMP-AE-4.

Q27. How did you estimate worker safety benefits?

A27. I estimated avoided worker exposure based on reduced injury and fatality risk for upgraded lines. I begin with Bureau of Labor Statistics fatality and injury rates for electrical power-line installers (20.5 fatalities per 100,000 full-time equivalent workers and approximately 174 injuries per 10,000 workers annually). I then apply risk reduction factors based on California and Virginia utility testing of covered conductors (63.5 percent for OH spacer cable and 99.42 percent for UG CIC), which is the best available information at this time, to calculate avoided incidents over the expected useful life of the mitigation.

Q28. How do you estimate public safety benefits?

A28. I calculate baseline public fatality and injury rates per mile of overhead distribution line using national data from the US Consumer Product Safety Commission, which reports approximately 100 electrical contact fatalities and 4,540 injuries annually. I then apply the same risk reduction factors used in the worker safety benefit estimation to estimate avoided public incidents.

Q29. What are the resulting values associated with increased safety?

A29. The worker safety values are applied to the UCT perspective. The resulting worker safety values are approximately $879 per mile for OH spacer cable and $1,376 per mile for UG CIC. The public safety values are $3,048 and $4,773 for OH spacer cable and UG CIC, respectively. The TRC perspective captures both the worker safety and public safety benefits, resulting in approximately $3,927 per mile for OH spacer cable and $6,149 per mile for UG CIC.

Modeling the UCT results of FY27 Resilience Projects

Q30. Please describe any changes you made to the BCA model to incorporate the UCT perspective.

A30. The UCT test compares costs and benefits that accrue directly to the utility. Therefore, the costs remain the same under both the UCT and TRC as the only costs included in the model are GMP costs. The UCT benefits include reduced storm expenditures, reduced O&M expenditures (including vegetation management, pole inspections, and changes to pole attachment revenue), reduction in line losses resulting from newer and larger cable sizes, and reduced non-storm outage restoration costs. Note that the Baseline Scenario was constructed based on a $7.5 million annual investment escalated for the first 10 years subject to inflation and the Handy-Whitman index for utility distribution plant assets.[20] This construction was chosen with consideration of the TRC calculation as the primary test, but nevertheless the UCT presented in the updated BCA can inform the Commission's review.

[20] *See* Prefiled Direct Testimony of Andy Eiden, at 37-39, describing the Baseline Scenario and differences in miles treated under each.

IV. Feeder-level BCA

Q31. Have you made any changes to your BCA model to consider feeder-level BCA results.

A31. Yes, in response to the Department's recommendation, GMP updated the Resilience BCA model to allow calculation of both the UCT and TRC on an individual feeder basis. Note that many feeders receive projects of varying types (e.g., OH spacer cable for some line segments, UG CIC for others, or a varied mix) depending on the unique needs of each circuit, including consideration of GMP's project selection criteria that go beyond just the BCA results.

Other Corrections

Q32. Are there any other changes you made to the updated BCA model?

A32. Yes. In discovery we identified an error in how ICE calculator values were entered in the initial BCA model.[21] I have since corrected the error and submitted an updated workbook as part of GMP's discovery responses. This resulted in a modest decrease to the portfolio-wide BCR and has been carried forward in this model iteration.

Q33. What are the final results of the updated BCA model?

A33. The cumulative changes described above result in a new portfolio TRC score of 11.42 for the overall FY27 resilience projects, with a 0.43 on the UCT. Table AE-3 shows the results for each project type. All the results in Table AE-3 use GMP's post-tax cost of capital for discounting all costs and benefits.

[21] *See* A.DPS.GMP.1-97.

Table AE-3: Final updated resilience BCA scores by test perspective, using post-tax cost of capital for discount rate

Project Type	Line Phases	UCT	TRC
OH Spacer	1-Phase	0.39	2.80
OH Spacer	3-Phase	0.35	21.01
UG CIC	1-Phase	0.54	2.72
Total		**0.43**	**11.42**

Q34. What are the results of your analysis on a feeder level?

A34. The results by feeder illustrate varying levels of benefits on the TRC test, based primarily on differences in customer composition, relative outage history by feeder, and the specific type of improvements. When assessing results at the feeder level, GMP did not include feeder backup benefits for several reasons. At the feeder level, a baseline counterfactual may not support larger feeder backup projects within the planning horizon, and detailed engineering and planning has not occurred for the baseline counterfactual sufficient to justify a feeder backup value. For ease of comparison between circuits in the feeder specific BCA, we have omitted feeder backup under both the Mitigation Scenario (where feeder backup would be realized), and the Baseline Scenario (where it may not) for all feeders. This results in a more conservative analysis and removes the complexity in planning how feeder backup might be deployed in a counterfactual in the baseline scenario. In reality, there is significant additional value created by feeder backup capability, especially on radial feed transmission fed substations, which we have appropriately included in the portfolio-wide rollup that is the primary focus of the BCA. I also note that achieving these potential feeder back-up benefits under the Department's

reduced resilience investment approach would be much more difficult, and likely would, at a minimum, substantially delay delivery of these additional meaningful benefits for customers.

Figure AE-4 below shows the TRC results by feeder. Figure AE-5 shows the UCT results by feeder.

Figure AE-4: BCR by Feeder Results (TRC, discount rate = post-tax cost of capital, no feeder backup value)

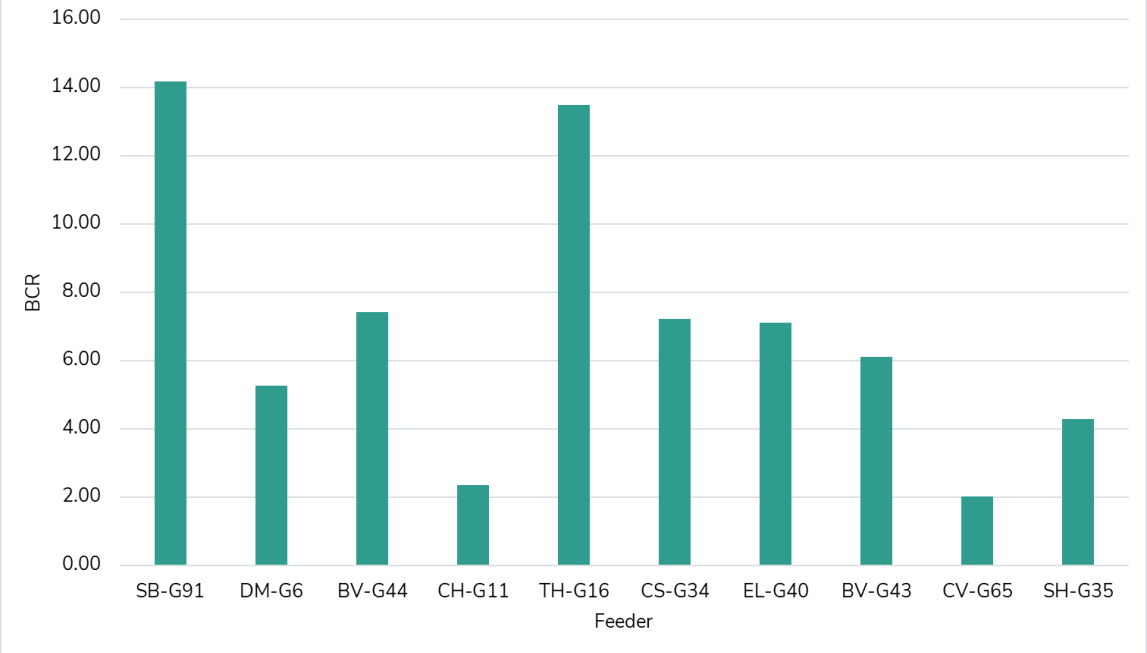
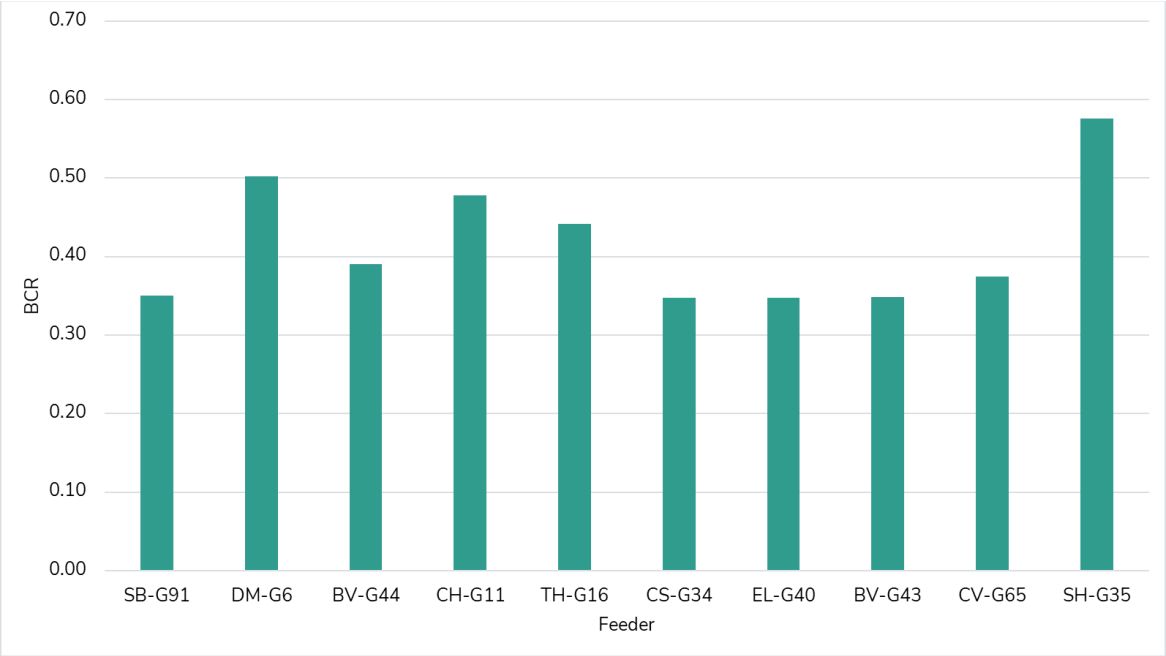


Figure AE-5: BCR by Feeder Results (UCT, discount rate = post-tax cost of capital)



V. Conclusion

Q35. Have any of your initial recommendations changed?

A35. No. As I have illustrated in the sections above, GMP has made meaningful improvements to its Resilience BCA model in response to DPS's recommendations, addressing both immediate improvements to the model, and introducing new quantitative approaches to address future climate risk and uncertainty. These refinements provide greater clarity around those conclusions, but do not alter them. I recommend the Commission approve GMP's proposed FY27 Resilience Projects as reasonable, cost-effective, and consistent with the Commission's prior orders. Specifically, even after considering more detailed future storm scenarios and applying a conservative discount rate to the customer resilience value included in the TRC, the FY27 Resilience Projects have an overall BCR of 11.42. UCT results are also substantially increased from the Department's estimates

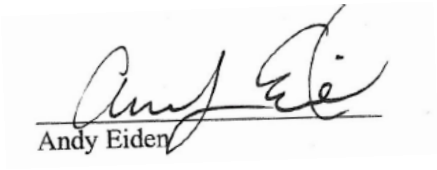
when safety benefits are taken into account. Overall, consideration of both these results, including the important resilience benefits outlined in the TRC which are the underlying goal of this work, only further highlights that the projects provide significant incremental value to GMP's customers and Vermont as a whole.

Q36. Does this conclude your testimony?

A36. Yes.

I, Andy Eiden, declare that the testimony and exhibits that I have sponsored are true and accurate to the best of my knowledge and belief and were prepared by me or under my direct supervision. I understand that if the above statement is false, I may be subject to sanctions by the Commission pursuant to 30 V.S.A. § 30.

Dated at Portland, Oregon on the 27th day of May, 2026.



Andy Eiden