STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Case No. 22-0175-INV

Tariff filing of Green Mountain Power requesting a 2.34% increase in base rates effective on bills rendered on or after October 1, 2022

Case No. 21-3707-PET

Petition of Green Mountain Power Corporation for approval of a Multi-Year Rate Plan (MYRP) pursuant to 30 V.S.A. Sections 209, 218, and 218d

PREFILED DIRECT TESTIMONY OF JACOB M. THOMAS ON BEHALF OF THE VERMONT DEPARTMENT OF PUBLIC SERVICE

April 20, 2022

Summary: Mr. Thomas (1) introduces the Vermont Department of Public Service ("Department" or "PSD") witnesses for this proceeding; (2) presents the Department's adjusted cost-of-service model developed to reflect all adjustments recommended by Department witnesses, (3) presents his review of GMP's load forecast, and (4) discusses a recommendation with respect to use of the Consumer Price Index in adjusting certain test year expenses. Overall, the Department recommends a cost-of-service adjustment of 2.12% for Fiscal Year 2023.

Mr. Thomas Sponsors the Following Exhibits:

Exhibit PSD-JMT–1	Professional Resume of Jacob M. Thomas
Exhibit PSD-JMT-2	Department Adjusted Cost of Service Model
Exhibit PSD-JMT-3	DPS1.Q68
Exhibit PSD-JMT-4	DPS1.Q77

Q1. Please state your full name, address, and occupation.

A1. My name is Jacob M. Thomas. My business address is 1850 Parkway Place, Suite 800, Marietta, Georgia 30067. I am a Principal of the firm GDS Associates, Inc. ("GDS"). I am a registered professional engineer in Georgia and a member of the American Statistical Association.

Q2. Please outline your formal education.

A2. I received a Bachelor of Science in Industrial Engineering from Georgia Institute of Technology in 2000. I received a Master of Business Administration with a concentration in Finance from Auburn University in 2006.

Q3. Please state your professional experience.

A3. I began working with GDS in June of 1996 as a cooperative student while attending the Georgia Institute of Technology. After graduation in December of 2000, I accepted a full-time position in GDS's Distribution Services department and became a Principal in GDS on January 1, 2019. In the past 25 plus years, I have provided statistical, financial, and economic consulting to utilities and regulatory agencies nationwide.

In the area of statistics, I have provided services to clients with respect to load forecasting, market research, sample design, load research, measurement and verification, and other statistical modeling. I have produced dozens of load forecasts, participated in, and managed all aspects of load research studies, managed customer survey processes, and performed impact evaluations of demand response and energy efficiency programs for several clients.

I have also evaluated short-term and long-term price elasticity of demand for forecasting purposes.

In the areas of finance and economics, I specialize in retail and wholesale Cost of Service ("COS") development and design, retail and wholesale rate design, financial forecasting, economic impact analysis, and benefit-cost analysis of demand response programs. My professional resume is provided as **Exhibit PSD-JMT-1**.

Q4. Have you previously testified before the Vermont Public Utility Commission ("Commission")?

A4. Yes. I have testified on behalf of the department in Docket No. 7440, in Case No. 18-0974-TF, and in Case No. 21-0898-TF.

Q5. Have you testified before any other regulatory commissions?

A5. Other than in Vermont, I have submitted testimony before the following regulatory bodies:

- Indiana Utility Regulatory Commission
- Michigan Public Service Commission
- North Carolina Utilities Commission
- North Dakota Public Service Commission
- Utah Public Service Commission

I have also co-authored reports filed or provided to regulators in cases before the Delaware Public Service Commission, the Kentucky Public Service Commission, and the Public Service Commission of Utah. In those joint reports, prepared in coordination with other

GDS experts and presented as a single consultant report, I was tasked with focusing on demand response, load research, and load forecasting issues.

Q6. For whom are you appearing?

A6. I am testifying on behalf of the Department.

Q7. Please describe the role and testimony of the other Department witnesses.

A7. The Department presents several witnesses in this proceeding. Besides myself, Steven Hunt, Managing Director at GDS Associates, will provide detailed information on several proposed adjustments and recommendations regarding GMP's accounting and cost of service.

Mr. Kevin Mara, Executive Vice President at GDS Associates, will address the Department's position with respect to the proper inclusion of various projects contained in GMP's MYRP. Mr. Mara discusses recommendations in key areas including capital expenditures for transmission, substation, distribution, generation, and transportation.

Mr. Chris Dawson, Principal at GDS Associates, addresses the power supply aspects to GMP's rate plan on behalf of the Department.

Carol Flint, the Department's Director of Consumer Affairs and Public Information, will address the numerous public comments received throughout this proceeding. She will also make recommendations regarding GMP's Service Quality Plan.

Scott Wheeler serves as the Department's Utilities Finance and Economics Analyst. He will address GMP's rebuttal testimony in the MYRP proceeding (Case No. 21-3707-PET) as well as reiterate the Department's position therein.

Q8. Were your testimony and exhibits prepared by you or under your direct supervision and control?

A8. Yes, they were.

Q9. Please summarize the purpose of your testimony.

A9. First, I will present the Department's COS model that reflects all adjustments to GMP's filed COS as recommended by all PSD witnesses, to the extent those recommended adjustments are measurable. In my testimony, I will show a table of each adjustment that includes which PSD witnesses support those adjustments. I will also describe how I made the adjustments, starting from the spreadsheet-based COS model provided by GMP in their working papers, and how I arrived at the PSD adjusted COS results. The PSD adjusted results and supporting schedules are provided in Exhibit PSD-JMT-2.

Next, I will discuss my review of Green Mountain Power's ("GMP") load forecast, in which I conclude industry standard methods have been used by GMP in developing a long-term forecast.

Finally, I provide a summary of my review of GMP's use of the Consumer Price Index ("CPI") for certain adjustments, as part of developing rate year expenses, and compare the

use of the CPI for that purpose to the use of the CPI in GMP's Multi-Year Rate Plan ("MYRP") framework.

THE DEPARTMENT'S COS MODEL

Q10. Can you please identify and summarize the major COS adjustments reflected in your COS model?

A10. The PSD witnesses have supported 13 adjustments to GMP's filed adjusted COS. The following table summarizes the adjustments and indicates which witnesses provide support for each adjustment.

Adj. Number	Description	PSD Witness(es)
PSD1	Consumer Price Index Adjustments	Thomas
PSD2	Shrewsbury & Gage Hydro Investments	Mara
PSD3	Minor Storm Restoration Fleet Expense	Hunt
PSD4	Fleet Expense Proration	Hunt
PSD5	Collection Agency Fees	Hunt
PSD6	IT Security Expense	Hunt
PSD7	Removal of Project 171161, Brockaway Mills Fiber	Hunt
PSD8	Weatherization Tax Calculation	Hunt
PSD9	Salaries and Wages	Hunt
PSD10	Tax Reform Regulatory Asset	Hunt
PSD11	Tier III Regulatory Asset	Hunt
PSD12	Fixed Price Contract	Hunt
PSD13	Active Medical Expense	Hunt

Q11. Please explain adjustment PSD1 – CPI Adjustments.

A11. Several adjustments are made to the COS to reflect the PSD1 adjustment, which is to achieve consistency with usage of consumer price indexes. All components of the adjustment are discussed later in my testimony. Adjustments include the utilization of the CPI-U NE in place of the CPI-U for the Unite States. The total impact of this adjustment

is a downward adjustment of $91,877 in several operating expense and other revenue categories.

Q12. Please explain adjustment PSD2 – Gage Hydro Investments.

A12. Several adjustments are made to the COS to reflect the PSD2 adjustment, which is to exclude the $3,281,976 investment in Gage hydro. Adjustments include removal of plant in service and accumulated depreciation from rate base and the associated reduction in depreciation expense. PSD witness Mr. Mara recommends and supports this adjustment.

Q13. Please explain adjustments PSD3 through PSD8.

A13. As described by PSD witness Mr. Hunt, GMP discovered a series of adjustments to the COS that needed to be made as part of the process of their response to GMPD.DPS2.Q1. These adjustments were identified and presented to the Department as a result of PSD discovery. Mr. Hunt summarizes each of those changes and supports those revisions as PSD3 through PSD8. In preparation of the Department's COS, I used files provided by GMP that reflect these adjustments as made by GMP. Therefore, I took no additional action to reflect the impacts of PSD3 through PSD8.

Q14. Please explain adjustment PSD9 – Salaries and Wages.

A14. PSD witness Mr. Hunt is recommending the adjustment for O&M wages and salaries be $273 thousand based on known and measurable standards. GMP has made a $677 thousand adjustment to the salaries and wages. Therefore, to model the impact of this adjustment, I reduced the amount of the adjustment by $404 thousand to reflect Mr. Hunts recommendation of a $273 thousand adjustment to the test year. The adjustment is made to GMP's COS adjustment 5. GMP's adjustments are spread among several expense

categories. I allocated the amount of the Department's adjustment based on the share of GMP's adjustment in each category, as shown in Table 1.

Table 1: Allocation of PSD9 to Operating Expense Categories

Category	**GMP Adjustment ($000)**	**GMP Percent of Total**	**Allocation of Department Adjustment ($000)**
Other Power Supply	14	2.1%	(9)
Other Transmission	17	2.5%	(10)
Distribution	250	36.9%	(149)
Customer Accounting	54	8.0%	(32)
Customer Service	50	7.4%	(30)
Admin & General	292	43.1%	(174)
Total	**677**	**100.0%**	**(404)**

Q15. Please explain adjustment PSD10 – Tax Reform Regulatory Asset.

A15. PSD witness Mr. Hunt is recommending removal of $320,283 in rate base associated with Tax Reform regulatory balances. To affect the change in the COS, I reduced regulatory assets in the rate base by $320,283 and reduced regulatory amortization expense by 1/29th ($11,044) of the $320,283 balance.

Q16. Please explain adjustment PSD11 – TIER III Regulatory Asset.

A16. PSD witness Mr. Hunt is recommending removal of $930,537 in rate base associated with TIER III regulatory asset balances. To affect the change in the COS, I reduced regulatory assets in the rate base by $930,537.

Q17. Please explain PSD12 – Fixed Price Contract.

A17. PSD witness Mr. Hunt is recommending removal of $78,000 from the FY24 revenue requirement to reflect his recommendation that an inflationary adjustment to certain operating expense categories is not appropriate given those costs are tied to fixed price contracts of certain durations. He also recommends similar adjustments to the FY25 and

FY26 revenue requirements for similar reasoning. These issues, since they reflect adjustments to the MYRP proposed expenses are not reflected in my Exhibit PSD-JMT-2, which sets forth the Department's recommended COS in the rate year of FY23.

Q18. Please explain PSD13 – Active Medical Expense.

A18. Mr. Hunt concludes that the escalation factor used by GMP in computing test year medical expenses, 7.3%, is too high and recommends use of a 5.2% escalation factor instead. As a result, Mr. Hunt recommends a $293 thousand reduction in the amount of adjustment in medical expenses as proposed by GMP. I reflect this adjustment in GMP's COS adjustment 10, reflecting an adjustment of $699 thousand as opposed to GMP's adjustment of $992 thousand.

Q19. What are the resultant COS impacts of the PSD adjustments you have presented above?

A19. GMP's original filing showed a FY23 revenue requirement of $685.8 million. In GMP's updated filing in response to the issues raised by PSD witness Mr. Hunt and identified as PSD3 through PSD8, total revenue requirements were reduced by $357 thousand. The impact of PSD1, PSD2, and PSD9 through PSD13 results in an additional reduction of $1,019 thousand, as shown in Exhibit PSD-JMT-2 column (5). The total impact of all the adjustments recommended by PSD witnesses is a reduction in adjusted total COS of $1,376 thousand, as shown on Page 1 of Exhibit PSD-JMT-2 column (4), resulting in a required base rate revenue adjustment of 2.12%, compared to the 2.34% increase originally recommended by GMP.

LOAD FORECAST

Q20. Please describe the review you conducted of GMP's load forecast.

A20. GMP presents their Fiscal Year ("FY") 2022 Budget Forecast Report as Exhibit GMP-ER-RB-5. The forecast is prepared by Itron, Inc. ("Itron") and was completed in November of 2021. The forecast provides forecasted energy sales for residential and non-residential customers for 2022-2041. I conducted a review of the methods and assumptions employed by Itron in developing the load forecast. In this review, I have concluded they have modeled the major elements one would expect of a load forecast prepared in 2022 and used methods that meet or exceed industry standards.

Q21. What elements of the overall load forecast did Itron develop?

A21. Itron's load forecast includes projections for residential energy sales and revenues, small commercial and industrial (C&I") energy sales and revenues, large C&I energy sales and revenues, and other class energy sales and revenues. Itron has included impacts for energy efficiency (both end-use efficiency gains and demand-side management program impacts), distributed retail solar generation, Tier 3 sales tied to cold-climate heat pump programs, and electric vehicle adoption. Furthermore, Itron's models capture impacts on residential and C&I load attributable to Covid-19. These elements include all the various components of a forecast that I would expect to find for GMP.

Q22. Please describe the modeling approaches deployed by GMP and Itron in developing the load forecast.

A22. Itron makes use of several modeling approaches, with the most prominent being Statistically Adjusted End-Use ("SAE") and econometric modeling methods.

SAE models are used for projecting residential average usage per household and small C&I energy sales. The SAE modeling framework involves computing indexes representing cooling consumption, heating consumption, and a base index representing usage for all non-weather sensitive end-uses. Each index takes into account various critical end-use, home, weather, and economic variables. Such variables include appliance market share, appliance efficiency, heating degree days or cooling degree days, household size, household income, price of electricity, trends in the improvement of the thermal shell of the building, and size of building. The indexes are then input into a multiple regression model to fit the historical indexes to historical energy usage patterns. I support the use of SAE modeling for residential average usage and small C&I energy sales. The method has been used by regulated utilities throughout the country and produces a forecast that is able to account for the fact that energy consumption has tended to decline in the last 15 years even as the economy has grown.

Itron also uses econometric regression modeling approaches for residential consumers, small C&I consumers, and large C&I energy sales. Econometric approaches have been an industry standard tool for developing load forecasts for decades. Other C&I sales are held

constant for the forecast period but have shown no real pattern in many years and represent only 0.09% of total system energy sales in 2021.

Q23. What else did you review and conclude about GMP's load forecast?

A23. I also reviewed model statistics that included model fit statistics, the resultant Analysis of Variance tables produced by Itron's regression software, and the signs of the coefficients for each forecast element.

With respect to model fit, the models have R-squared and adjusted R-squared values that would be expected for modeling the respective variable. The residential and small C&I models all have adjusted R-square values in excess of 0.90, as well as reasonable in-sample Mean Absolute Percent Error ("MAPE"). The adjusted R-square for the large C&I sales model is a little lower at 0.743 with a MAPE of 4%. However, the largest C&I class can be difficult to model, and inspection of the underlying monthly data indicates the model appears to be fitting the overall long-term trend well despite having some difficulty projecting the monthly pattern in sales. I conclude that the large C&I model exhibits an appropriate level of model fit.

In my review, I also noted that a first-order autoregressive parameter was employed by Itron in the models exhibiting serial correlation as measured by the Durbin-Watson statistic. Serial correlation is often a result of trying to model time series data such as number of customers. The autoregressive parameter is an appropriate tool to use to account for such serial correlation.

I also reviewed the t-statistics and p-values for all independent variables in each model and observed the sign of the coefficient. Generally, a forecaster expects to see a t-statistic in excess of 2.0 and a corresponding p-value below 5%. Furthermore, the sign of the coefficient indicates whether the independent variable and the dependent variable are directly or indirectly related. For example, price of electricity and demand for electricity are inversely related (when price increases, we expect based on economic theory that demand will decrease). Given that inverse relationship, a regression for electricity sales that includes price should produce a negative coefficient for price. As part of my review, I concluded that all signs of coefficients confirm my expectations, and that t-statistics and p-values are appropriate. Although some p-values are in excess of 5%, they are on indicator variables used to adjust the forecast for the month of the year. In such a case, it is reasonable to keep the variable in the model as a set of indicator variables even if the p-value is above expectation.

INFLATIONARY ADJUSTMENTS

Q24. Do you propose an adjustment to GMP's Rate Year expenses and credits based on their use of the CPI?

A24. Yes—this recommendation serves as PSD1, Consumer Price Index Adjustments. For certain inflation adjustments made by GMP, a national measure of inflation is used. However, GMP has used, and proposes to continue to use, the Northeast regional variation for inflation in the MYRP. In the MYRP, GMP proposes to adjust certain categories of costs by the inflation measure on an annual basis[1]. I recommend use of the Northeast regional variation for both adjustments for computing rate year expenses and in the MYRP.

Q25. Please describe adjustment PSD1 further.

A25. In several instances, GMP determines an estimated expense or credit for the rate year by averaging annual historical costs and adjusting this calculated average by inflation to convert the dollar amount to an estimated FY 2023 price level. For example, regarding the Minor Storm Restoration estimate (COS Adjustment No. 7), Mr. Burke identified Minor Storm Restoration expenses over the five-year period FY 2017 through FY 2021, inflated each fiscal year amount to a FY 2023 price level and averaged the inflated amounts calculated for each period.1

However, with respect to the items listed in Table 2 below, GMP based their inflation adjustment on the Consumer Price Index for All Urban Consumers ("CPI-U") as reported for the whole United States of America[2] and not the Northeast regional variation ("CPI-U NE"), which is the specific inflation index measure used as part of GMP's proposed MYRP.[3] To provide for consistency in GMP's use of inflationary measures, I recommend that the COS Adjustments, listed in Table 2 below, use CPI-U NE as opposed to CPI-U.

Additionally, regarding the Mutual Aid item included in Other Operating Revenue (COS Adjustment No. 27), I observed that the historical amounts were only indexed to a FY 2021 price level and not a FY 2023 price level. Therefore, for internal consistency across the

[1] See the supporting Excel file provided by GMP named "COS Adj One-Time Adjustments 12-16-21", tab FY23 COS Adjustment, Excel row 30, columns G-M.
[2] See Exhibit PSD-JMT-3 (GMP response to PSD.DPS1.Q68).
[3] See Exhibit PSD-JMT-4 (GMP response to PSD.DPS1.Q77).

2023 COS, I find it appropriate that the Mutual Aid item be inflated to FY 2023 price level using GMP's inflation assumptions.

Table 2: Summary of Adjustment PSD1

			Rate Year FY2023			
GMP Witness	**COS Adj. No.**	**Description**	**As Filed**	**GMP Supp Adj**	**GDS Adjusted Value**	**Delta: Increase / (Decrease) from GMP Supp Adj**
Castgonguay	COS 2b	Production Joint-Owned O&M Costs	$7,929,998	$7,929,998	$7,883,591	($46,407)
Ryan/Bingel	COS 16	O&M Test Year to Rate Year One-Time Items:				
		Adjustment 11: Collection Agency Fees	$127,667	$127,667	$126,750	($917)
		Adjustment 12: In-person board meetings	$6,479	$6,479	$6,429	($50)
		Adjustment 13: Resumed Travel Expenses	$22,733	$22,733	$22,554	($179)
Ryan/Bingel	COS 27	Other Operating Revenue: Mutual Aid	($565,832)	($565,832)	($586,189)	($20,357)
Burke	COS 7	O&M Minor Storm Restoration	$3,726,672	$3,422,868	$3,398,902	($23,966)
		TOTAL				**($91,877)**

Q26. Do you have any other observations concerning inflation?

A26. I do. I reviewed the reasonableness of GMP's use of a 2.5% annual Payroll Inflation Assumption as was used for its 2023 COS and MYRP.[4] While it is greater than the 2.0% inflation factor used by GMP in its COS analysis, I note that it is less than the union contract annual pay increases experienced over the 2016-2022 period, with such pay increases ranging from 2.80% to 3.25%. GMP's use of a 2.5% factor, then, represents a middle position between the CPI inflationary factor and recent negotiated pay increases. On that basis, I find it reasonable to utilize a 2.5% annual Payroll Inflation Assumption.

Q27. Does this conclude your direct testimony?

A27. Yes.

[4] For example, refer to Exhibit GMP ER-RB-6, page C4 Power Supply Other.