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July 25, 2025

BY ELECTRONIC FILING

Mr. Bernard Logan, Clerk
STATE CORPORATION COMMISSION
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RE: Application of Virginia Electric & Power Company for approval of a certificate of public convenience and necessity to construct and operate the proposed Chesterfield Energy Reliability Center electric generation and related transmission facilities pursuant to Virginia Code §§ 56-580 D and 56-46.1 and for approval of a rate adjustment clause, designated Rider CERC under Virginia Code § 56-585.1 A 6

Case No. PUR-2025-00037

Dear Mr. Logan:

Please find enclosed for filing in the above-captioned case in public version only the Direct Testimony of Devi Glick on behalf of the Sierra Club. Please do not hesitate to contact me if you have any questions regarding this filing.

Thank you,

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**COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION**

APPLICATION OF

VIRGINIA ELECTRIC & POWER COMPANY

Case No. PUR-2025-00037

For approval of a certificate of public convenience and necessity to construct and operate the proposed Chesterfield Energy Reliability Center electric generation and related transmission facilities pursuant to Virginia Code §§ 56-580 D and 56-46.1 and for approval of a rate adjustment clause, designated Rider CERC under Virginia Code § 56-585.1 A 6

DIRECT TESTIMONY of

DEVI GLICK

on behalf of the

SIERRA CLUB

July 25, 2025

Summary of the Direct Testimony of Devi Glick

Dominion submitted an application for approval of a certificate of public convenience and necessity (CPCN) to build the proposed Chesterfield Energy Reliability Center (CERC) project. In its application, Dominion claims that the CERC facility is necessary to meet load and maintain system reliability and that it is economic relative to alternatives. The Company is requesting a variance from the Virginia Clean Economy Act (VCEA) requirement that it achieve Commission-ordered energy efficiency targets before adding new fossil fuel generating resources.

I evaluated Dominion's claims that CERC is needed, that it is the least-cost resource option to meet Dominion's needs, and that the Company has a compelling reliability need for the energy efficiency exemption. In this testimony, I assess Dominion's economic analysis and then present the results of my own independent economic analysis. I also assess Dominion's reliability analysis and present the results of my own independent reliability analysis.

I found that Dominion's economic analysis was insufficient to support its application because the Company did not look at a single optimized portfolio of solar, battery storage, and increased energy efficiency to replace CERC. Instead, it looked at specific replacement resources in isolation. In my economic analysis, I modeled two alternative portfolios that are compliant with the Company's energy efficiency requirements and replace some or all of CERC with incremental quantities of solar and battery storage. I found only marginal cost differences relative to the portfolio with CERC.

I found that Dominion's reliability analysis, specifically the analysis completed by Brattle, was also insufficient. The Company did not evaluate an alternative portfolio; instead, it modeled one scenario with CERC and one without CERC. The finding that the system is less reliable when a resource is removed and not replaced with anything is not helpful or meaningful. In my reliability modeling, I tested both of my alternative portfolios. I found that the portfolios without CERC had similar, if not better, reliability performance relative to a system with the CERC project.

Overall, my economic and reliability analyses demonstrate that an alternative portfolio can have comparable costs, lower carbon dioxide (CO₂) emissions, and similar, if not better, reliability performance relative to a system with the full CERC project. In addition, the alternative portfolios have lower risk and exposure to future fuel price volatility.

I recommend that the Commission reject Dominion's CPCN application. The Commission should require Dominion to conduct updated economic and reliability modeling with increased energy efficiency sufficient to comply with Commission orders. The Commission should also require the Company to conduct reliability modeling of optimized alternative resource portfolios that also comply with energy efficiency requirements.

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1. INTRODUCTION & PURPOSE OF TESTIMONY

1 **Q Please state your name and occupation.**

2 A My name is Devi Glick. I am a Senior Principal at Synapse Energy Economics, Inc.
3 (Synapse). My business address is 485 Massachusetts Avenue, Suite 3, Cambridge,
4 Massachusetts 02139.

5 **Q Please describe Synapse Energy Economics.**

6 A Synapse is a research and consulting firm specializing in energy and environmental
7 issues, including electric generation, transmission and distribution system reliability,
8 ratemaking and rate design, electric industry restructuring and market power, electricity
9 market prices, stranded costs, efficiency, renewable energy, environmental quality, and
10 nuclear power. Synapse's clients include state consumer advocates, public utilities
11 commission staff, attorneys general, environmental organizations, federal government
12 agencies, and utilities.

13 **Q Please summarize your work experience and educational background.**

14 A At Synapse, I conduct economic analysis and write testimony and publications that focus
15 on a variety of issues related to electric utilities. These issues include power plant
16 economics, electric system dispatch, integrated resource planning, environmental
17 compliance technologies and strategies, and valuation of distributed energy resources. I
18 have submitted expert testimony before state utility regulators in over 60 litigated
19 proceedings across 20 states.

1 In the course of my work, I develop in-house models and perform analysis using
2 industry-standard electricity power system models. I am proficient in the use of
3 spreadsheet analysis tools, as well as optimization and electric dispatch models. I have
4 directly run EnCompass and PLEXOS and have reviewed inputs and outputs for several
5 other models.

6 Before joining Synapse, I worked at Rocky Mountain Institute, focusing on a wide range
7 of energy and electricity issues. I have a master's degree in public policy and a master's
8 degree in environmental science from the University of Michigan, as well as a bachelor's
9 degree in environmental studies from Middlebury College. I have 13 years of professional
10 experience as a consultant, researcher, and analyst. A copy of my current resume is
11 attached as Exhibit DG-1.

12 **Q On whose behalf are you testifying in this case?**

13 A I am testifying on behalf of Sierra Club.

14 **Q Have you testified before the State Corporation Commission of Virginia (SCC)?**

15 A Yes, I submitted testimony in Case No. PUR-2025-00058, Case No. PUR-2025-00059,
16 Case No. PUR-2024-00184, Case No. PUR-2023-00066, Case No. PUR-2023-00005,
17 Case No. PUR-2022-00006, and Case No. PUR-2018-00195—all dockets related to
18 resource planning or environmental compliance investments by Virginia Electric and
19 Power Company (Dominion or the Company). I also submitted testimony in Case No.
20 PUR-2022-00051, Appalachian Power Company's Integrated Resource Planning (IRP)
21 docket.

1 **Q What is the purpose of your testimony in this proceeding?**

2 A In this proceeding, I review Dominion’s application for approval of a certificate of public
3 convenience and necessity (CPCN) to build the proposed Chesterfield Energy Reliability
4 Center (CERC) project. I evaluate whether Dominion has demonstrated a reliability
5 concern sufficient to merit an exemption from the Virginia Clean Economy Act (VCEA)
6 requirement that it meet its energy efficiency targets before adding new fossil fuel
7 generation. I also evaluate whether Dominion’s analysis is sufficient to demonstrate that
8 the full quantity of the proposed resource addition is necessary to meet load, maintain
9 system reliability, and is economic relative to alternatives. Finally, I evaluate whether
10 Dominion has demonstrated that the Company adequately accounted for the risks posed
11 by continued investment in fossil fuel resources.

12 **Q Please summarize your modeling and analysis.**

13 A I assess Dominion’s economic and reliability analyses, which compare scenarios with
14 CERC to several limited alternative scenarios. I present the results of my economic
15 analysis and reliability modeling of an optimized alternative portfolio of solar, battery
16 storage, and energy efficiency (Synapse analysis). The alternative portfolios I modeled
17 are compliant with the Company’s energy efficiency requirements and replace CERC
18 with incremental quantities of solar and battery storage. My economic and reliability
19 analyses demonstrate that an alternative portfolio can have comparable costs, lower
20 carbon dioxide (CO₂) emissions, and similar, if not better, reliability performance to a
21 system with the full CERC project.

1 **Q How is your testimony structured?**

2 A Following this introduction in Section 1:

3 ➤ In Section 2, I summarize my findings and recommendations for the Commission.

4 ➤ In Section 3, I summarize Dominion's CPCN Application and its economic and
5 reliability modeling.

6 ➤ In Section 4, I discuss Dominion and my economic analyses. I describe the modeling
7 frameworks and resource portfolios included in each. I show how my economic
8 results compare to the results the Company presented. I explain the differences
9 between my economic modeling results and Dominion's.

10 ➤ In Section 5, I discuss the reliability analyses conducted by Dominion, Brattle (under
11 engagement by Dominion), and my reliability analysis. I describe the modeling tools,
12 input assumptions, and resource portfolios used in each analysis. I compare the
13 reliability of a baseline scenario containing CERC to alternative portfolios that
14 replace CERC with additional quantities of renewable energy, battery storage, and
15 energy efficiency.

16 ➤ In Section 6, I discuss the risks of Dominion increasing its reliance on gas generation
17 resources.

18 **Q What information do you rely upon for your analysis, findings, and observations?**

19 A My analysis relies primarily on the workpapers, exhibits, and discovery responses of
20 Dominion's witnesses. I also rely on other publicly available documents and data, which
21 I cite throughout my testimony.

22 **Q Are you sponsoring any exhibits?**

23 A Yes. I am sponsoring the following exhibits:

Exhibit No.	Description of Exhibit
Exhibit DG-1	Resume of Devi Glick
Exhibit DG-2	Dominion Response to Sierra Club Request No. 3-4
Exhibit DG-3	Dominion Response to Sierra Club Request No. 3-2
Exhibit DG-4	Dominion Response to Appalachian Voices Request No. 2-4(b)
Exhibit DG-5	Dominion Response to Appalachian Voices Request No. 2-2
Exhibit DG-6	Dominion Response to Sierra Club Request No. 2-3
Exhibit DG-7	Case No. PUR-2024-000184, Dominion Response to Staff Request No. 7-154(k)
Exhibit DG-8	Dominion Response to Sierra Club Request No. 4-2

2. FINDINGS & RECOMMENDATIONS

1 **Q Please summarize your findings.**

2 **A My primary findings are:**

- 3 ➤ Dominion is not planning energy efficiency investments sufficient to comply with
4 VCEA requirements and SCC directives, including those recently established under
5 Virginia Code § 5596.2 B 3. The VCEA requires Dominion to demonstrate a genuine
6 threat to reliability, among other things, before it receives approval to construct a
7 new carbon-emitting generation facility.
- 8 ➤ Dominion has not adequately justified that CERC is the lowest-cost and lowest-
9 economic-risk way to address its capacity and energy needs. The Company's
10 economic analysis of alternative resource portfolios is limited to a non-optimized set
11 of alternative resources.
- 12 ➤ My economic analysis of an alternative portfolio shows that a portfolio of energy
13 efficiency, solar, and storage optimized to replace CERC has a net present value
14 revenue requirement (NPVRR) that is only marginally higher than Dominion's
15 portfolio that includes CERC (NPVRR within 0.35 percent).

- 1 ➤ Dominion failed to conduct reliability analysis for any viable alternative portfolios or
2 any scenarios that are compliant with energy efficiency requirements from the
3 Commission’s Final Order in Case No. PUR-2023-00227. Therefore, Dominion has
4 not adequately justified a need for the entire CERC project to satisfy energy,
5 capacity, and grid reliability needs.
- 6 ➤ My reliability modeling shows that an alternative portfolio with optimized quantities
7 of energy efficiency, solar, and storage resources can provide reliability benefits
8 similar to those of the CERC portfolio.
- 9 ➤ Dominion is creating a reliability risk by not complying with its energy efficiency
10 requirements. The addition of energy efficiency sufficient to comply with
11 Commission-ordered energy efficiency requirements reduces load and reduces
12 reliability risks.

13 Based on those findings, I make the following recommendations:

- 14 ➤ The Commission should reject Dominion’s CPCN application for the full CERC
15 project.
- 16 ➤ The Commission should require Dominion to conduct reliability modeling to
17 evaluate how its system capacity, energy, and reliability needs change—relative to
18 current energy efficiency levels—with incremental energy efficiency sufficient to
19 comply with Commission-ordered energy efficiency requirements.
- 20 ➤ The Commission should require Dominion to submit reliability modeling of
21 optimized alternative resource portfolios that are compliant with Commission-
22 ordered energy efficiency requirements in all future fossil fuel generation CPCNs.
- 23 ➤ The Commission should require Dominion to develop a plan for how it can invest in
24 energy efficiency sufficient to comply with its statutory obligations.

- 1 ➤ The Commission should instruct Dominion to issue an All-Source Request for
2 Proposals (RFP) and evaluate whether the RFP yields capacity and energy resources
3 that are less costly than the proposed facility.
- 4 ➤ Dominion should focus its near-term procurement on no-regrets resource
5 additions—primarily solar and battery capacity. Not only are those resources
6 consistent with the Commonwealth’s statutory energy policy, but their cost-
7 effectiveness is apparent both in my modeling and the Company’s own IRP, which
8 adds these clean-energy resources as fast as the underlying modeling allows.

3. OVERVIEW OF APPLICATION

9 **Q What is Dominion requesting in its application?**

10 A Dominion is requesting approval of a CPCN to construct and operate CERC, a 944-
11 megawatt (MW) electric generating facility comprised of four natural-gas-fired
12 combustion turbines and projected to be commercially operational by June 1, 2029.¹ The
13 plant will be sited at the same location as the retiring Chesterfield coal plant.

14 To receive approval to construct a CO₂-emitting generating facility, the VCEA requires
15 Dominion to demonstrate that it has met its energy savings goals and that the identified
16 need cannot be met more affordably through alternative resources. Specifically, Virginia
17 Code § 56-585.1 A 6 states:

18 A utility seeking to construct a generating facility that
19 emits carbon dioxide shall demonstrate that it has *already*
20 *met the energy savings goals* and that the *identified need*
21 *cannot be met more affordably* through the *deployment or*

1 Application at 5.

1 *utilization of demand-side resources or energy storage resources*
2 and that it *has considered and weighed alternative options,*
3 including third-party market alternatives in its selection
4 process.²

5 Additionally, if Dominion cannot meet its mandated energy efficiency savings goals, it
6 will need a variance from the energy efficiency requirement under § 56-585.1 A 5 c of the
7 VCEA to get approval of this CPCN:

8 Unless the Commission finds . . . that there is a threat to
9 the reliability or security of electric service to the utility's
10 customers, the Commission shall not approve construction
11 of any new utility-owned, generating facilities that emit
12 carbon dioxide . . . unless the utility has already met the
13 energy savings goals identified in 56-596.2 and the
14 Commission finds that supply-side resources are more
15 cost-effective than demand-side or energy storage
16 resources.

17 Because the Company has not met the energy savings goals identified in the statute, it
18 must prove in this case both (1) that there is an actual threat to reliability, and (2) that
19 the CERC is more cost-effective than demand-side or energy storage resources.

20 **Q What are Dominion's energy efficiency targets and requirements?**

21 A The VCEA sets a statutory requirement of five (5) percent reduction in energy
22 consumption in 2025 relative to 2019 levels.³ Beyond 2025, the Commission ordered

2 (Emphasis added).

3 Virginia Code § 56-596.2 B 2.

1 targets of three (3) percent in 2026, four (4) percent in 2027, and five (5) percent in 2028
2 in Case No. PUR-2023-00227.⁴

3 Dominion’s planning failed to comply with the VCEA or Commission orders. Instead,
4 the Company is modeling baseline energy efficiency assumptions consistent with what it
5 proposed—and the Commission rejected—in PUR-2023-00227: 2.09 percent in 2026,
6 2.39 percent in 2027, and 2.72 percent in 2028.⁵

7 **Q How has Dominion historically performed with energy efficiency program adoption**
8 **and performance?**

9 A Dominion has consistently fallen short of both its statutory energy efficiency
10 requirements⁶ and the more conservative targets that its potential studies⁷ indicate are
11 feasible. Based on 2021 measure-year data, Dominion ranked 42nd out of 52 utilities that
12 the American Council for an Energy-Efficient Economy (ACEEE) reviewed in terms of

4 *Commonwealth ex rel. State Corporation Commission in re Establishing Energy Efficiency Savings Targets for Virginia Electric & Power Company*, Case No. PUR-2023-00227, Final Order (February 27, 2025), available at <https://bit.ly/3XhGBOI> (Dominion EE Targets Final Order).

5 *Commonwealth ex rel. State Corporation Commission in re: Establishing Energy Efficiency Savings Targets for Virginia Electric & Power Company*, Case No. PUR-2023-00227, Dominion Energy’s Proposed Energy Efficiency Savings Targets (June 12, 2024), available at <http://bit.ly/459i4OU> (Dominion EE Targets Proposal). Percent is described as a cumulative energy efficiency savings relative to 2019 sales.

6 Dominion EE Targets Final Order, *supra* note 4.

7 Dominion EE Targets Proposal, *supra* note 5, Attachment 1 (Final Report of DNV Energy Insights on Virginia Energy Efficiency Potential Study 2024–2033).

1 net annual incremental energy savings as a percentage of energy sales.⁸ The Company’s
2 poor historical performance means that there is still substantial energy efficiency
3 potential available for the Company. Energy efficiency experts highlighted these
4 concerns and remaining potential in Case No. PUR-2023-00227.⁹

5 It is concerning that the Company has been using its poor historical performance to
6 lower the bar and reduce its energy efficiency goals even further claiming that “realistic
7 achievements tend to be somewhat lower than the potential estimates.”¹⁰ The Company
8 goes on to claim that Virginia has unique factors that make energy efficiency deployment
9 challenging relative to other states; these include the legal and regulatory framework, the
10 low historical avoided energy, and capacity costs.¹¹

11 But poor program performance means the program was poorly designed or
12 implemented—not that it inherently has low potential. And in response to expanded
13 energy efficiency program requirements in the VCEA, the Company has improved its

8 AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, *2023 Utility Energy Efficiency Scorecard* at 51, tbl 8 (August 2023), available at <http://bit.ly/3J3dOZF> (2023 ACEEE Scorecard).

9 *See, e.g., Commonwealth ex rel. State Corporation Commission in re: Establishing Energy Efficiency Savings Targets for Virginia Electric & Power Company*, Case No. PUR-2023-00227, Direct Testimony of Jim Grevatt on behalf of Appalachian Voices (September 16, 2024), available at <http://bit.ly/44QxyZi>.

10 Dominion EE Targets Proposal, *supra* note 5, at iv (“The proposed savings targets for both the portfolio overall and the IAQ programs are slightly less than the corresponding projections from the 2024 Potential Study.”).

11 *Id.*

1 energy efficiency performance. ACEEE highlighted this improvement in its 2023 Utility
2 Energy Efficiency Scorecard, in which Dominion moved up from 50th to 27th in terms of
3 overall energy efficiency performance. ACEEE explicitly credited the VCEA as driving
4 the Company's improvements.¹² The Commission seems to agree with the energy
5 efficiency experts, as evidenced by its ordered energy efficiency targets in PUR-2023-
6 00227, and pushed the Company to continue to pursue higher levels of energy efficiency
7 deployment.

8 **Q What analysis did Dominion conduct in support of its application?**

9 A Dominion conducted both economic and reliability analyses in support of its application.
10 The Company conducted three separate economic analyses in an attempt to show
11 compliance with the requirements of Virginia Code § 56-585.1 A 6:

12 1. The first economic analysis was a comparison between CERC and third-party
13 market alternative sources of dispatchable generation. The Company issued an
14 RFP seeking incremental dispatchable generation, screened bids using an internal
15 busbar tool, and then used PLEXOS to estimate the expected customer value of
16 each bid.¹³

17 2. The second economic analysis was a comparison of CERC to portfolios
18 consisting of renewable and energy storage resources. Renewables and storage

12 2023 ACEEE Scorecard, *supra* note 8, at 8.

13 Direct Testimony of Lisa R. Crabtree (Crabtree Direct) at 32.

resources were hard-coded in and designed to approximately replace the energy and capacity of CERC.¹⁴

3. The third economic analysis assessed whether Dominion could replace the entire CERC Project with DSM measures.¹⁵

Dominion also included two reliability analyses in its application:

1. The first reliability analysis was a “forward casting” modeling exercise. Dominion removed the CERC plant from its preferred IRP portfolio, without replacing it with any incremental capacity from other resources. Dominion assessed whether the resultant portfolio would be capable of serving load, assuming similar weather conditions to a January 2025 cold snap would recur in 2030.¹⁶
2. For the second reliability analysis, Dominion engaged Brattle Group (Brattle) to complete an additional reliability analysis. Brattle evaluated two portfolios: one that closely matches the Company’s IRP builds, and one “no new gas” portfolio that does not include any new gas or dispatchable resources and maintains existing build limits for any other resources in the Dominion zone. Brattle then dispatched these two portfolios through 29 different three-day weather periods and compared the reliability performance of the two portfolios, as measured by energy and capacity violations.¹⁷ Energy violations are hours in which the model cannot meet hourly demand with the given portfolio of resources. Capacity

¹⁴ Dominion Response to Sierra Club Request No. 3-4 (enclosed as Exhibit DG-2).

¹⁵ Crabtree Direct at 36.

¹⁶ *Id.* at 23.

¹⁷ Direct Testimony of Akarsh Sheilendranath (Sheilendranath Direct) at 7.

1 violations are defined as hours during which the model cannot meet an hourly
2 reserve margin of 4.4 percent.¹⁸

3 Table 1 below summarizes these economic and reliability analyses, which I describe in
4 more detail in Sections 4 and 5.

**Table 1. Summary of Dominion’s Economic and Reliability
Analyses Conducted in Support of this Application**

Category	Name	Description
Economic Analysis	Dispatchable Generation RFP Comparison	Busbar and PLEXOS analysis of third-party market alternative dispatchable generation bids solicited through fall 2024 RFP
	Storage & Renewables Comparison	PLEXOS analysis of alternative portfolios consisting of solar and battery storage
	DSM Analysis	Spreadsheet analysis of replacing entire CERC project with DSM measures
Reliability Analysis	Dominion Extreme Weather Cold Snap Analysis	Assessment of how Dominion’s system, absent CERC or any other replacement resources, would perform if a cold snap similar to January 2025 were to occur in 2030
	Brattle Reliability Study	Reliability analysis of one portfolio including CERC and one “no new gas” portfolio under 29 different three-day weather periods

Sources: Crabtree Direct; Sheilendranath Direct.

18 Sheilendranath Direct at 14; Dominion Response to Sierra Club Request No. 3-2 (enclosed as Exhibit DG-3).

4. ECONOMIC ANALYSIS OF CERC COMPARED TO ALTERNATIVES

1 **Q Please summarize this section.**

2 A In this section, I evaluate the economic analysis Dominion conducted in support of its
3 application. I find that this analysis was insufficient to support the Company's
4 application because Dominion did not model an optimized replacement resource
5 portfolio. I then present my economic alternative analysis. For my analysis, I relied on
6 inputs from Dominion's 2024 IRP as a foundation, and then updated the energy
7 efficiency assumptions, CERC costs, and 2030 resource build limits. My economic
8 analysis shows that an alternative resource portfolio that replaces half the CERC
9 capacity is only marginally more expensive than the baseline with CERC (\$0.44 billion).
10 A second alternative resource portfolio that replaces the full CERC capacity has an even
11 smaller delta with the baseline (\$0.26 billion). If social cost of carbon (SCCO₂) benefits
12 are considered, both alternative scenarios provide net benefits relative to the baseline
13 with CERC.

4.1. Dominion's Economic Analyses

14 **Q Please describe Dominion's economic analyses.**

15 A As summarized in Section 3 above, Dominion conducted three economic analyses in
16 support of this Application.

17 The Company's first analysis focused on comparing CERC to third-party market
18 alternatives for other dispatchable generation sources. The Company issued an RFP
19 seeking dispatchable generation in Fall 2024. To assess the bids, Dominion first

1 developed a levelized busbar curve to calculate the levelized cost of energy of the
2 proposals at different capacity factors. Then, using the PLEXOS model, Dominion used
3 the same baseline portfolio (based on its 2024 IRP modeling), swapped out the CERC
4 project for each of the bids in turn, and calculated a \$/kW net present value metric for
5 each proposal (adjusted by an SCCO_2 value).¹⁹ Based on this analysis, the Company
6 determined that CERC was more favorable than any third-party alternative dispatchable
7 generation bid that it received through this RFP process. Most of the information
8 involved in this analysis was confidential.

9 The Company's second analysis compared the customer value of a baseline scenario
10 including CERC project to alternative portfolios of renewable and energy storage
11 resources. Dominion held constant all other inputs, including load and DSM
12 assumptions. The Company modeled two alternative portfolios. Neither of these
13 portfolios were optimized; rather they were manually designed to replace the firm
14 capacity and energy value of the entire CERC project.²⁰ The "Alternative Renewable
15 Portfolio" included an incremental 300 MW of tracking solar, 160 MW of onshore wind,
16 and 1,500 MW of 4-hour energy storage resources beyond what was included in its
17 baseline portfolio. The "Storage Only Portfolio" included 1,600 MW of 4-hour battery
18 storage resources beyond what was included in its baseline portfolio.²¹ Dominion then

19 Crabtree Direct at 33.

20 See Exhibit DG-2 (Dominion Response to Sierra Club Request No. 3-4).

21 Crabtree Direct at 34.

1 used the PLEXOS model to calculate the NPV of each portfolio and compared it to the
2 baseline portfolio including CERC. This analysis showed that Dominion's modeled
3 alternative portfolios were more expensive than the baseline portfolio.²²

4 The Company's third analysis assessed the costs of replacing the CERC project entirely
5 with DSM resources. Dominion calculated that it would need an incremental 1,274–
6 1,536 MW of DSM programs to match the firm capacity of the CERC project. The
7 Company then estimated the cost of approximately 1,500 MW of DSM resources using
8 the costs of existing Company programs and escalating these costs at inflation.²³ This
9 analysis concluded that DSM resources alone would not be able to meet the Company's
10 capacity and energy needs more economically than the CERC project.

11 **Q What concerns do you have with the framework of Dominion's economic analyses?**

12 A Dominion's economic analyses does not look at a single optimized portfolio of solar,
13 battery storage, and DSM resources to replace CERC; instead Dominion evaluated
14 different resource types in isolation. This is concerning because each of these resources
15 offer different benefits and have different restrictions. And when viewed together, the
16 benefits they provide surpass their individual contributions.

17 DSM measures can reduce system peak and annual energy, reducing the total energy and
18 capacity needs. But DSM also can get more expensive as cheaper efficiency measures

22 *Id.* at 35.

23 *Id.* at 38.

1 reach high penetration levels and the Company has to deploy incrementally more
2 expensive measures to achieve savings. Different DSM measures can also provide
3 different amounts of energy or capacity savings depending on the specific measure
4 characteristics.

5 For instance, Solar is a zero-marginal-cost energy resource with renewable energy credits
6 (REC) benefits, making it a very attractive energy resource. But its availability is subject
7 to daily weather patterns, so it alone doesn't provide sufficient firm capacity year-round.
8 Battery storage provides firming capabilities but does not itself produce energy. Battery
9 storage resources therefore require low-cost energy to maximize energy arbitrage
10 benefits.

11 These resources should not be considered in isolation; rather the Company should
12 consider how they can be optimally deployed in concert to meet its capacity and energy
13 needs. While Dominion's "Alternative Renewable Portfolio" does include both
14 renewable energy and energy storage, Dominion did not optimize the resource
15 quantities, leading to a lower ratio of renewable energy to energy storage than I found
16 was optimal in my independent analysis. In addition, the Company did not include DSM
17 resources. To maximize the benefits of battery storage, it should be paired with a
18 sufficient quantity of renewable energy generation and DSM measures.

19 In addition, Dominion's alternative portfolios all use its 2024 IRP as a foundation and
20 then add and remove incremental quantities of resources relative to that baseline.
21 Dominion's 2024 IRP contains several concerning assumptions, including resource build

1 limits and noncompliant energy efficiency assumptions, making it an unsuitable baseline
2 from which to start this analysis.

3 **Q Did Dominion look at optimized portfolios as part of its 2024 IRP?**

4 A No. As I cover in my testimony in Docket PUR-2024-00184, Dominion's constraints on
5 resource additions in its 2024 IRP prevented it from truly optimizing. These issues carry
6 over to the CERC economic analysis. First, as mentioned above, Dominion places
7 substantial build limits on solar and battery storage in the early years, meaning the model
8 cannot select battery storage and solar as replacements for CERC. Specifically, in its IRP
9 modeling, Dominion places an annual build limit of 350 MW per year for battery storage,
10 and 1,020 MW per year for solar PV. The model builds as much solar PV and battery
11 storage as is allowed every year starting in 2029 and 2031 respectively.²⁴ Even in
12 Dominion's increased build limit sensitivity, the model adds as much solar PV and
13 battery storage as it is allowed to in every year from 2029–2039 and 2031–2039,
14 respectively. This shows that, but-for the build limits, incremental solar and storage
15 resources would be economic for Dominion.²⁵

16 Dominion also fails to model sufficient energy efficiency to comply with the VCEA
17 requirement of five (5) percent energy consumption reductions in 2025 from 2019 levels

24 *Commonwealth ex rel. State Corporation Commission in re: Virginia Electric & Power Company's 2024 Integrated Resource Plan Pursuant to Virginia Code § 56-697 et seq.*, Case No. PUR-2024-00184, Direct Testimony of Devi Glick at 20 (February 28, 2025), available at <http://bit.ly/4f5cnpQ>.

25 *Id.*

1 in any of its scenarios.²⁶ Nor does Dominion's modeling meet the Commission-ordered
2 targets of three (3) percent in 2026, four (4) percent in 2027, and five (5) percent in
3 2028.²⁷ These issues in Dominion's 2024 IRP skew the modeling results and lead to
4 biased and non- optimized portfolio selections.

4.2. Synapse's Economic Analyses

5 **Q Please describe the modeling exercise you completed related to Dominion's CERC**
6 **CPCN Application.**

7 A I completed independent modeling that replicates Dominion's baseline scenario
8 inclusive of CERC. I also modeled alternative scenarios that illustrate potential
9 optimized pathways for Dominion to meet its energy and capacity needs with solar,
10 energy storage, and energy efficiency programs as alternatives to building CERC.

11 **Q Please summarize the modeling tools that you relied on for your Synapse analysis.**

12 A For the Synapse analysis, I used the EnCompass capacity optimization and dispatch
13 model to simulate resource choice and impacts in Dominion's service territory. The
14 model was developed by Anchor Power Solutions (now Yes Energy) and covers all facets
15 of power system planning, including:

- 16 • Short-term scheduling, including detailed unit commitment and economic
17 dispatch, with modeling of load shaping and shifting capabilities;

26 Virginia Code § 56-596.2 B 2.

27 Dominion EE Targets Final Order, *supra* note 4.

- 1 • Mid-term energy budgeting analysis, including maintenance scheduling and risk
2 analysis;
- 3 • Long-term integrated resource planning, including capital project optimization,
4 economic generating unit requirements, and environmental compliance; and
- 5 • Market price forecasting for energy, ancillary services, capacity, and
6 environmental programs.

7 **Q Is the EnCompass model used throughout the power sector?**

8 A Yes. The model was released in 2016 and is currently used by multiple major investor-
9 owned utilities. These include Minnesota Power, Otter Tail Power, Excel Energy (in
10 Minnesota, New Mexico, Colorado, and Texas), Great River Energy, Duke Energy (in
11 the Carolinas and Indiana), and Public Service Company of New Mexico.

12 **Q Describe the scenarios that you modeled.**

13 A I modeled three scenarios focused on isolating the impacts of building CERC or
14 replacing CERC with alternative resource portfolios:

15 ➤ **Baseline scenario:** I ran this scenario to develop a baseline revenue requirement
16 for the Company's proposed base portfolio with CERC to compare to my
17 alternative portfolios.

18 ➤ **Half CERC Replacement:** In this alternative scenario, I removed half of the
19 CERC capacity. To replace this capacity, I increased the 2030 build limits for
20 solar and storage and used an energy efficiency trajectory that is compliant with
21 SCC directed targets.

22 ➤ **Full CERC Replacement:** In the second alternative scenario I removed the
23 entire CERC project. To replace the full capacity of CERC, I further increased
24 the 2030 build limits above the Half Replacement scenario. I included the same
25 energy efficiency trajectory as the Half Replacement scenario.

1 **Q Explain why you modeled a portfolio that replaces only half of the CERC capacity**
2 **as well as a portfolio that replaces the entire CERC project.**

3 A The Company has previously raised concerns about its ability to build solar and battery
4 storage beyond levels modeled in its 2024 IRP.²⁸ The Half CERC Replacement scenario
5 illustrates an alternative pathway at a similar cost that provides net benefits in terms of
6 lower CO₂ emissions, reduced risk from volatile fuel prices, and a lower investment in
7 gas resources that will ultimately need to be retired by 2045 under the VCEA, relative to
8 the baseline scenario. This scenario requires a lower quantity of solar and energy storage
9 capacity additions than the full replacement scenario. It represents a viable alternative
10 portfolio in the event that the Company is not able to build the quantity of resources
11 included in the Full CERC Replacement portfolio on the required timeline.

12 **Q How do your input assumptions and model parameters compare to the ones**
13 **Dominion uses?**

14 A Aside from the energy efficiency trajectory and 2030 build limits, I maintain as many of
15 Dominion's assumptions as possible in my scenarios, to ensure my results are
16 comparable to Dominion's.²⁹ Specifically, I use Dominion's assumptions for peak and

28 *Commonwealth ex rel. State Corporation Commission in re: Virginia Electric & Power Company's 2024 Integrated Resource Plan Pursuant to Virginia Code § 56-697 et seq.*, Case No. PUR-2024-00184, Rebuttal Testimony of Shane T. Compton at 23 (March 25, 2025), available at <http://bit.ly/44RnH44>.

29 Synapse did not independently evaluate each of the assumptions it incorporated from Dominion's modeling. Rather, we opted to focus on and modify only a few of the Company's assumptions, so as to isolate their impacts and ensure our results were comparable.

1 annual energy, load shape, reserve margin, offshore wind unit project additions,
2 distributed solar additions, fuel commodity prices, resource capacity values, resource
3 maximum capacity factors, resource capital costs, and import limits. Table 2 shows the
4 sources I relied on for the Synapse modeling.

Table 2. Synapse EnCompass Modeling Input Sources

Item	Source
Load Forecast	Dominion 2024 IRP, Appendix 2B-8
Reserve Margin Requirement	Response to Office of Attorney General 2-3, Attachment OAG Set 02-03 (JLM)
Coal Prices	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
Gas Prices	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
Onshore Wind Costs	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
Offshore Wind Costs	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
Solar Costs	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
Battery Costs	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
New Gas CT Cost	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
SMR Cost	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
Heat Rates	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
Firm Capacity Ratings	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
Existing Resource Nameplate Capacities	Horizons National Database
Existing Resource FOM & VOM Costs	Response to Sierra Club 4-1, Attachment Sierra Club Set 04-01 (a)(KLC) ES
RPS Requirement	Response to Sierra Club 5-4, Attachment 05-04 JLM (CONF) for REC requirements through 2035; x]
Renewable Capacity Factors	Response to Sierra Club 4-5, Attachment Sierra Club Set 04-05(a) (JLM) CONF

Financial Parameters (WACC)	Response to Staff 2-12, Attachment Staff Set 02-12 (KLC)
Interconnection & Integration Costs	Dominion 2024 IRP, Appendix 2E at 2

Note: Many of these input sources include voluminous spreadsheet data. As such, the input sources are not attached as exhibits to this testimony but can be provided to the Commission and properly-authorized parties upon request.

1 **Q Explain how you modeled energy efficiency in the Synapse alternative portfolios?**

2 A I modeled energy efficiency sufficient for Dominion to reach the Commission-directed
3 targets of three (3) percent in 2026, four (4) percent in 2027, and five (5) percent in
4 2028.³⁰ I assumed that Dominion’s Baseline scenario included energy efficiency savings
5 in line with its proposed targets from Case No. PUR-2023-00227. I then designed an
6 updated load forecast with incremental energy efficiency to close the gap between what
7 Dominion already modeled and what is necessary to meet the Commission-ordered
8 targets. I similarly calculated energy efficiency program costs that are incremental to
9 program costs already included in Dominion’s load.

10 **Q Are these energy efficiency assumptions reasonable and feasible?**

11 A Yes. My assumptions for both energy efficiency potential and load shape are reasonable.

12 As discussed above, Dominion’s poor historical performance with energy efficiency
13 program adoption and performance means that there is still ample energy efficiency
14 potential for the Company to tap into. And the Commission order in PUR-2023-00227

30 These percentages represent cumulative energy efficiency savings relative to 2019 sales. See Virginia Code § 56-596.2 B 1 a.

1 and Dominion's own improvements when required by the VCEA³¹ demonstrate that the
2 barriers to higher energy efficiency deployment are largely within Dominion's control.

3 Regarding load shape, I assumed that the energy efficiency load profile is evenly
4 distributed across all hours of the year. While specific energy efficiency measures can
5 have differential impact on peak and energy, non-peak energy efficiency measures
6 generally reduce consumption across the board. Therefore, a flat shape is a reasonable
7 baseline and conservative assumption.

8 Additionally, I assume no incremental peak-targeted demand response or load flexibility
9 explicitly associated with new large load. This means that, if anything, my energy
10 efficiency assumptions are conservative. As discussed later in my testimony, some states,
11 for example Texas,³² are beginning to require load flexibility for new large loads to
12 interconnect to the grid to allow management of peak.

13 **Q Explain how you developed the alternative build limit assumptions used in the**
14 **Synapse modeling?**

15 A First, I conducted capacity expansion runs where I increased the build limits for solar
16 and battery storage for a scenario including CERC, a scenario excluding CERC, and a
17 scenario with half CERC capacity. With these higher build limits, the model is not

31 See 2023 ACEEE Scorecard, *supra* note 8, at 8.

32 Brian Martucci, *Texas Law Gives Grid Operator Power to Disconnect Data Centers During Crisis*, UTILITY DIVE (June 25, 2025), available at <http://bit.ly/4m5CGhP>.

1 constrained in its ability to replace CERC (in the scenarios without CERC) and thus is
2 able to optimize replacement quantities of solar and batteries. I used these modeling
3 results to calculate the incremental quantities of solar and battery storage additions that
4 the model selects when CERC is removed. Then, I used the optimized incremental
5 additions from this first round of modeling to update the solar and storage baseline IRP
6 build limits for 2030. In the Synapse alternative scenarios, instead of being able to build
7 half or all of the CERC capacity in 2030, the model can build up to the replacement
8 quantity of solar and storage that was calculated using the first round of modeling runs.
9 We only changed the build limits for 2030 by these incremental quantities, while keeping
10 other resource additions outside of this year constant between the Baseline and
11 alternative portfolios. This allowed me to isolate the impacts of replacing the CERC
12 plant in 2030 specifically.

13 When allowed to optimize CERC's replacement in the first round of modeling, I found
14 that the model selected to build an incremental 1.9 GW of 4-hour battery storage and
15 1.44 GW of solar in the full CERC replacement case, and an incremental 0.95 GW of
16 battery storage and 0.84 GW of solar in the half CERC replacement case. In the Synapse
17 model results presented below, I increased the Company's 2024 IRP build limits by
18 these quantities in 2030.

1 **Q How reasonable is it to assume that Dominion could build this quantity of solar and**
2 **storage by 2030?**

3 A One of the barriers that Dominion has cited to deploying greater quantities of solar and
4 storage is PJM’s interconnection queue.³³ PJM has been working to reduce its
5 interconnection study time, including a collaboration with Google and Tapestry to
6 automate and use artificial intelligence to speed up its study timelines.³⁴ Furthermore,
7 since Dominion’s 2024 IRP was found legally sufficient, the Federal Energy Regulatory
8 Commission (FERC) has approved PJM’s Surplus Interconnection Service (SIS)
9 proposal, which will enable unused portions of capacity interconnection rights for
10 resources that do not operate continuously.³⁵ SIS provides a fast-track pathway for
11 resources to move through the interconnection process. This would enable Dominion to
12 pair new solar and storage resources with existing peaker plants and share the capacity
13 interconnection rights between the resources. A recent study on SIS resource
14 deployment potential conducted by GridLab and Berkely estimates that Dominion could
15 use the SIS pathway to deploy up to 1,729 total MW of clean-energy capacity—including

33 *Id.*

34 Aftab Khan, *PJM Generation Interconnection Reforms Continue to Produce Results*, PJM
INSIDE LINES (June 4, 2025), available at <http://bit.ly/40s9Boo>.

35 PJM INSIDE LINES, *FERC Accepts Two PJM Proposals to Expedite Supply Additions*
(February 12, 2025), available at <http://bit.ly/46pLYkh>.

1 up to 1,208 MW of solar, 1,621 MW of wind, or 1,729 MW of storage.³⁶ Resources
2 deployed through the SIS pathway must share a capacity interconnection right (CIR)
3 with the other resource, limiting the combined firm capacity contribution of both
4 resources to the given CIR. However, many resources are not currently rated at a firm
5 accreditation equal to their CIR, so pairing them with storage can still increase the total
6 firm capacity available behind the CIR. In addition, many of the modeled benefits of solar
7 are primarily energy benefits that act in tandem with storage in the Load Serving Entity,
8 which are not affected by this joint firm capacity constraint.

9 Additionally, while I modeled these resource additions as all occurring in 2030 to present
10 a consistent temporal evaluation framework with the expected CERC online date, these
11 incremental resources could come online over a period of years (such as between 2029–
12 2032). In our scenarios, the build limits prevented resources from coming online in any
13 year but 2030; if we relaxed this constraint the model would likely spread out the
14 additions over a number of years. This would reduce the portfolio NPVRRs.

15 **Q How do the resource additions compare between the Baseline, Half CERC**
16 **Replacement, and Full CERC Replacement scenarios?**

17 A In each scenario, the model selected to build up to the allowed resource build limits. In
18 the Half CERC Replacement scenario, half of the CERC project capacity is removed and

36 Umed Paliwal & Amol Phadke, *Scarcity to Surplus*, UC BERKELEY & GRIDLAB, <https://www.scarcitytosurplus.com/> (2024) (filtered to set RTO = PJM, State = VA and Owner = Dominion Energy).

1 replaced by 0.84 GW of solar and 0.95 GW of 4-hour energy storage in 2030 (the same
2 year CERC is modeled as coming online). In the Full CERC Replacement scenario, the
3 full CERC project is replaced by 1.44 GW of solar and 1.9 GW of 4-hour energy storage
4 (built in 2030). In addition, Dominion’s 2030 peak load is reduced by 0.29 GW due to
5 increased energy efficiency investment. Table 3 summarizes the 2030 capacity and the
6 peak load reduction due to incremental energy efficiency in the Synapse modeled
7 portfolios.

Table 3. Comparison of Nameplate Capacity and Incremental EE Peak Load Reduction in the Synapse Modeled Portfolios, 2030 (GW)

Resource Type	Baseline	Half CERC Replacement	Full CERC Replacement
Solar	7.3	+0.84	+1.44
Offshore Wind	2.6	0.00	0.00
Onshore Wind	0.0	0.00	0.00
Battery Storage	1.6	+0.95	+1.90
Nuclear	3.5	0.00	0.00
Coal	2.7	0.00	0.00
Gas	10.6	-0.47	-0.94
Biomass /Landfill / Other	0.0	0.00	0.00
Pumped Hydro	1.8	0.00	0.00
Hydro	0.3	0.00	0.00
Total Nameplate Capacity	30.4	+1.32	+2.40
Incremental EE Peak Load Reduction	0	0.29	0.29

8 *Note: Values shown in CERC replacement columns are incremental to the Baseline scenario.*

1 **Q How do firm capacity quantities differ between the Baseline portfolio and the**
2 **Synapse alternative portfolios in 2030?**

3 A The Half CERC Replacement and Full CERC Replacement scenarios respectively
4 provide 0.1 GW and 0.3 GW of additional firm capacity compared to the Baseline
5 scenario with CERC. This is driven by the combination of 4-hour energy storage and
6 solar that is built in the alternative portfolios, which decreases the need for capacity
7 market purchases. Battery storage in particular provides an additional 0.5 GW of firm
8 capacity in the Half CERC Replacement scenario and an additional 0.9 GW in the Full
9 CERC Replacement scenario, relative to the Baseline. This in turn reduces ratepayer
10 exposure to PJM’s capacity market price fluctuations. Table 4 displays the 2030 firm
11 capacity (rounded) in Synapse’s modeled portfolios.

Table 4. Comparison of Firm Capacity in the Synapse Modeled Portfolios, 2030 (GW)

Resource Type	Baseline	Half CERC Replacement	Full CERC Replacement
Solar	0.4	+0.1	+0.1
Offshore Wind	1.0	0.0	0.0
Onshore Wind	0.0	0.0	0.0
Battery Storage	0.8	+0.5	+0.9
Nuclear	3.3	0.0	0.0
Coal	2.3	0.0	0.0
Gas	8.8	-0.4	-0.8
Biomass /Landfill / Other	0.0	0.0	0.0
Pumped Hydro	1.2	0.0	0.0
Hydro	0.1	0.0	0.0
Total Firm Capacity	17.8	+0.1	+0.3
Incremental EE Peak Load Reduction	0	-0.29	-0.29

Note: Values shown in CERC replacement columns are incremental to the Baseline scenario.

1 **Q** How do generation levels by resource type differ between the Baseline portfolio and
2 **your Synapse alternative portfolios?**

3 **A** Figure 1 shows the generation in the Baseline portfolio and Figure 2 shows generation in
4 the CERC Full Replacement portfolio. One key difference is the baseline load. My
5 Synapse alternative portfolios have lower total annual generation because of the higher
6 energy efficiency investment. Specifically, in my alternative scenarios Dominion's
7 energy need is lower than the CERC baseline by 2.1 percent in 2030 and 3.7 percent in
8 2039. Another difference is that the solar replacement resources have a higher capacity
9 factor than CERC, meaning the replacement resources generate more energy than

1 CERC generates in the baseline scenario. In my baseline scenario, CERC's capacity
2 factor peaks in 2030 at 4.4 percent. CERC's capacity factor declines over the rest of the
3 model period, averaging 2.7 percent from 2030-2039. In contrast, the replacement solar
4 resources operate at a capacity factor of approximately 23 percent.

5 The combination of the lower annual energy due to energy efficiency and additional
6 energy from the higher capacity factor of the solar resources lead to a reduced reliance
7 on gas generation and imported energy in the alternative portfolios. Average gas
8 generation from 2030–2039 is 8.8 percent per year lower in the Half CERC Replacement
9 portfolio and 11.2 percent per year lower in the Full CERC Replacement portfolio
10 relative to the baseline. Net energy imports are reduced by 4.8 percent from 2030–2039
11 in the Half CERC Replacement portfolio and 6.9 percent in the Full CERC Replacement
12 portfolio. Because my alternative portfolios are less reliant on both gas generation and
13 market energy purchases, they reduce ratepayer exposure to volatility in wholesale
14 energy markets and in gas prices.

Figure 1. Baseline Portfolio Generation by Resource Type

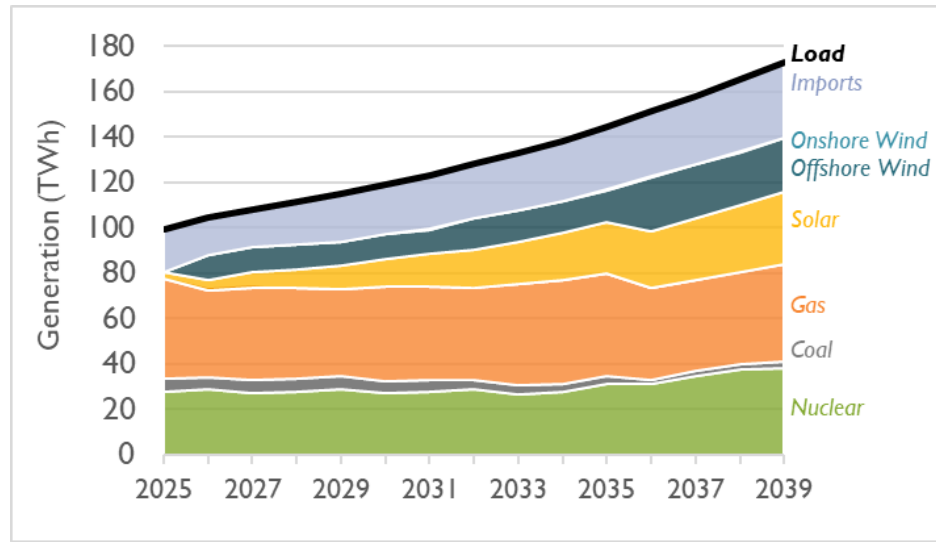
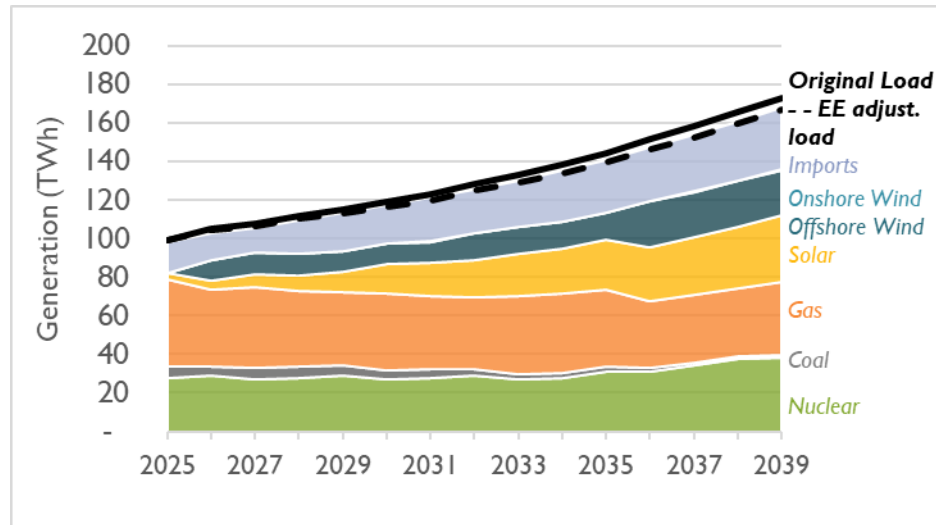


Figure 2. CERC Full Replacement Portfolio Generation by Resource Type

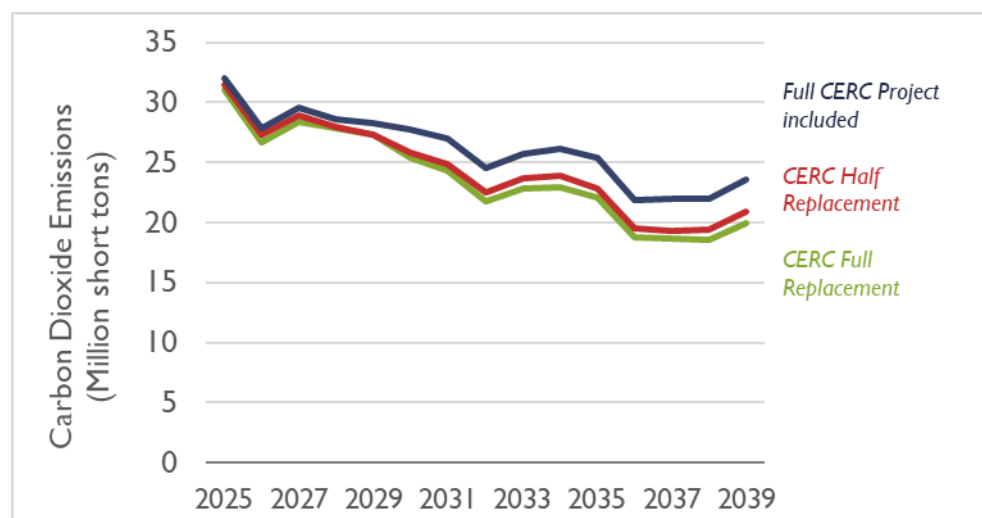


1 **Q** How do carbon dioxide emissions compare between the Baseline portfolio and
2 Synapse alternative portfolio?

3 **A** Cumulative CO₂ emissions are lower in my alternative portfolios compared to the
4 Baseline portfolio (Figure 3). In the Half Replacement portfolio, cumulative CO₂
5 emissions are 26 million tons lower, representing a seven (7) percent decrease relative to
6 the Baseline portfolio. In the Full Replacement portfolio, cumulative CO₂ emissions are

1 35 million tons lower, representing a nine (9) percent decrease relative to the Baseline
 2 portfolio. Applying an SCCO₂ value of \$51 per metric ton set in 2020—the same value
 3 used in the SCCO₂ analysis presented by Company Crabtree³⁷—results in NPV benefits
 4 of \$0.9 billion in the Half Replacement portfolio and NPV benefits of \$1.2 billion in the
 5 Full Replacement portfolio.

Figure 3. Carbon Dioxide Emissions in Scenarios Modeled by Synapse



6 **Q How do the revenue requirement and total system costs compare between Baseline**
 7 **and alternative portfolios?**

8 A The total NPVRR cost to ratepayers is \$0.44 billion (0.59 percent) more in the Half
 9 CERC Replacement portfolio and \$0.26 billion (0.35 percent) more in the Full CERC
 10 Replacement portfolio, relative to the Baseline portfolio. If the SCCO₂ values described

37 INTERAGENCY WORKING GROUP ON SOCIAL COST OF GREENHOUSE GASES, *Technical Support Document: Social Cost of Carbon, Methane & Nitrous Oxide Interim Estimates under Executive Order 13990* (February 2021), available at <http://bit.ly/44USrkD>.

1 above are included, the Half CERC Replacement provides \$0.47 billion in net benefits
2 and the Full CERC Replacement provides \$0.98 billion in net benefits. Table 5
3 summarizes the NPVRR results of the three scenarios that Synapse modeled, with and
4 without the inclusion of SCCO₂. The NPVRR of my alternative portfolios includes the
5 incremental cost of the additional energy efficiency investments and REC benefits.

Table 5. NPVRR of Synapse Portfolios

Cost Category	Baseline	Half CERC Replacement	Full CERC Replacement
Operating Cost	\$62.66	\$61.19	\$61.97
Property Taxes	\$0.82	\$0.78	\$0.74
Other Costs	\$0.05	\$0.05	\$0.05
Book Depreciation	\$4.51	\$4.35	\$4.28
Allowed Return	\$5.79	\$5.38	\$5.17
RPS Penalties	\$0.00	\$0.00	\$0.00
Integration	\$1.11	\$1.18	\$1.18
REC Purchases	-\$0.29	-\$0.57	-\$1.21
Incremental EE Costs	\$0.00	\$2.74	\$2.74
Total Cost	\$74.65	\$75.09	\$74.91
SCCO₂	\$16.17	\$15.27	\$14.93
Total Cost + SCCO₂	\$90.82	\$90.36	\$89.85

Note: Other costs include insurance, program costs, and RGGI compliance. NPV does not include transmission costs.

6 **Q Explain the difference in NPVRR between the Full and Half CERC Replacement**
7 **scenarios.**

8 A The NPVRR of the Full CERC Replacement portfolio is marginally lower (\$0.17 billion)
9 than the Half CERC Replacement portfolio. This is because the Full CERC

1 Replacement includes more solar, leading to greater energy benefits and REC benefits. In
2 addition, the Full CERC Replacement scenario entirely avoids the costs of building the
3 CERC project.

4 **Q How will changes to federal clean energy tax credits enacted by the recent passage**
5 **of the “One Big Beautiful Bill” impact the results of your analysis?**

6 A The recent passage of the One Big Beautiful Bill Act (OBBBA) made updates to the
7 Section 48E investment tax credit (ITC) and Section 45Y production tax credit (PTC)
8 eligibility requirements for solar and wind facilities. To qualify for the ITC or PTC, solar
9 and wind facilities must be placed in service before December 31, 2027, or start
10 construction within 12 months of the enactment of the law. The OBBBA does not make
11 changes to the ITC eligibility requirements for energy storage resources that begin
12 construction through 2033 (however it does update the ITC phase-out timeline to
13 definitively start in 2033, as opposed to conditioning the phase-out of the ITC on U.S.
14 electric sector emissions targets).³⁸

15 The passage of the OBBA will not impact the costs of energy storage resources built
16 prior to 2033.

17 For solar resources, I relied on Dominion’s 2024 IRP cost estimates, which are either
18 represented as annual PPA costs, or combination resources with part of the costs
19 represented as upfront capital costs and part of the costs represented as annual fixed

38 H.R.1 - One Big Beautiful Bill Act. Available at: <http://bit.ly/3INFhyp>.

1 costs. These solar cost estimates were developed prior to the passage of the OBBA and
2 would have factored in either the PTC or ITC. While the passage of the OBBA may
3 increase the costs of solar resources above what was included in either my modeling or
4 Dominion's, the cost increases will not necessarily be proportional to the magnitude of
5 the tax credits that were removed. More likely, the market will gradually adjust to the
6 new regulatory environment and developers will streamline their operations to be
7 competitive under this new regime.

8 Additionally, capital costs for solar are not a binding constraint in any of the modeling
9 conducted by Dominion, Brattle or Synapse. Rather, all three models are building up to
10 their respective allowed build limits every year. Even without the federal clean energy
11 tax credits, solar is likely still an economic resource option.

12 Cost estimates for all energy generation resources include some amount of uncertainty.
13 While Dominion has a fixed price contract to control CERC's capital costs,³⁹ there is no
14 cost cap in this docket to guarantee ratepayers won't pay more than Dominion estimates
15 for the project. Additionally, the fuel costs and the costs of firm gas supply remain
16 uncertain and subject to market volatility.

39 Direct Testimony of Jeffrey G. Miscikowski (Miscikowski Direct) at 10.

1 **Q Why does your modeling show similar NPVRR results for your alternatives, while**
2 **Dominion found substantially higher cost deltas when it evaluated alternative**
3 **supply-side resources?**

4 A These modeling results are different than Dominion's analysis of its alternative supply-
5 side portfolios because the Company did not include any additional energy efficiency and
6 limited incremental solar deployment beyond what is included in its baseline scenario.
7 Energy efficiency reduces the annual energy requirement in my alternative scenarios,
8 which in turn reduces operating costs. While Dominion did conduct economic analysis
9 of replacing the entire CERC plant with DSM measures, it did not include any
10 incremental DSM measures in the alternative supply-side portfolios. As discussed above,
11 the combination of energy efficiency and replacement solar lead to lower gas generation,
12 and lower net energy and capacity imports. This reduces fuel costs, variable operations
13 and maintenance (VO&M) costs, and energy and capacity market purchase costs. In
14 addition, my replacement scenarios both have greater net REC revenue than the baseline
15 scenario. The increased energy efficiency reduces the REC requirement and the
16 replacement solar increases REC supply. Combined, these effects result in a surplus of
17 RECs, increasing the REC benefit that the alternative scenarios provide.

18 **Q Please explain why your alternative portfolios are a better option for Dominion**
19 **ratepayers, given your NPVRR results are slightly higher than the baseline with**
20 **CERC.**

21 A The differences in NPVRR between the Baseline portfolio with CERC and my
22 alternative portfolios is only 0.3 percent (Full CERC Replacement) and 0.6 percent (Half

1 CERC Replacement) over the entire modeling horizon. Modeling conducted over a 15-
2 year horizon will never be able to perfectly forecast the future, but the guidance these
3 results provide is that pursuing a cleaner portfolio can mitigate considerable gas price
4 uncertainties, reduce ratepayer exposure to wholesale energy market costs, and, as I
5 discuss in the following section, ensure a more reliable system in one of the extreme
6 scenarios that I analyzed, without a material change in costs. As Table 5 shows, when the
7 social cost of increased CO₂ emissions is considered, my cleaner portfolios are less costly
8 than the baseline with CERC.

9 **Q What should the Commission take away from your Synapse modeling?**

10 A Synapse’s alternative portfolio, which includes an energy savings trajectory compliant
11 with Commission-directed targets and an optimized quantity of replacement battery
12 storage and solar resources, illustrates a comparable cost and cleaner pathway to meeting
13 Dominion’s capacity and energy needs. This alternative portfolio reduces ratepayer risk
14 by lowering reliance on wholesale market purchases and reducing exposure to natural gas
15 fuel price volatility. Under a scenario with higher gas prices, it is possible that my
16 alternative scenarios would provide net cost savings (even before considering SCCO₂)
17 relative to the baseline.

18 Dominion’s modeling examined different solution sets in isolation, rather than diverse,
19 comprehensive portfolios. As I discuss in the following section, my alternative portfolio
20 is also similarly reliable to a baseline portfolio, demonstrating that building traditional
21 “dispatchable generation” such as combustion turbines is not the only viable pathway to
22 meeting reliability needs.

1 **Q What are your key recommendations from your Synapse modeling?**

2 A Dominion should issue an All-Source Request for Proposals that allows renewables
3 paired with storage and demand-side resources to participate. Dominion should also
4 model a scenario that is compliant with SCC-directed energy efficiency targets to assess
5 how DSM can be used to reduce the need to build additional capacity resources.
6 Proactive procurement of clean energy resources paired with battery storage, as well as
7 increased investment in energy efficiency programs, can provide a similar cost and lower
8 risk pathway to meeting Dominion’s resource needs.

5. DOMINION’S RELIABILITY NEEDS

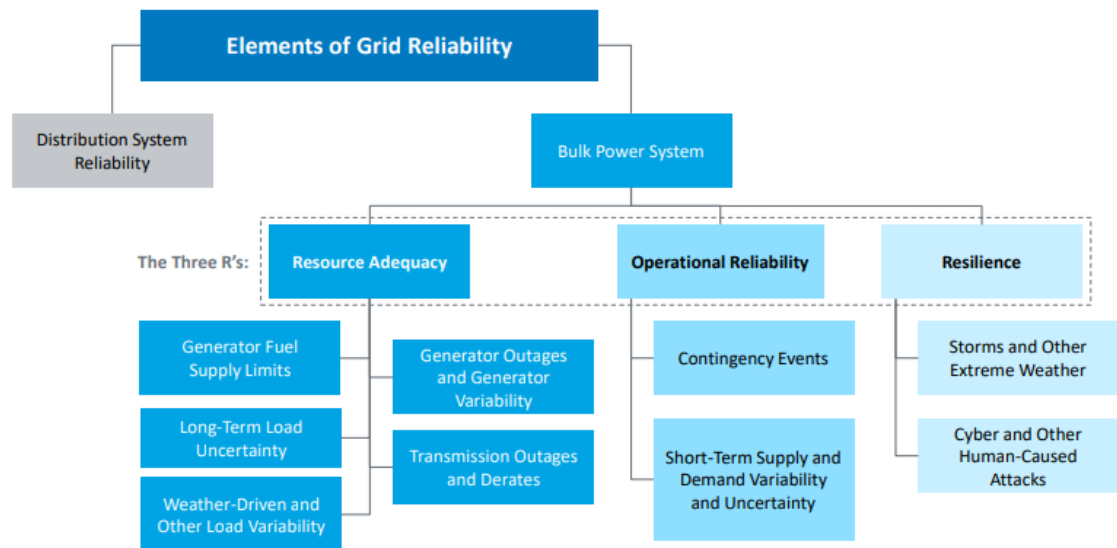
9 **Q Please summarize this section.**

10 A In this section, I outline the different categories of reliability. I evaluate Dominion’s
11 reliability modeling, including the different portfolios and weather scenarios that it
12 examined. I then present my reliability modeling. My analysis uses the same framework
13 as the Brattle reliability analysis to assess the reliability of the portfolios described in the
14 economic analysis section above. While Dominion did not conduct reliability analysis of
15 replacement resource portfolios or of portfolios with energy efficiency sufficient to
16 comply with the VCEA, I did. My reliability analysis shows that its alternative portfolios,
17 which contain a more diverse set of resources, are at least, if not more, reliable than the
18 CERC-inclusive portfolio.

1 **Q Please explain the different components of reliability.**

2 **A** There are three key components of reliability: resource adequacy, operational reliability,
3 and resilience. Figure 4 below illustrates these concepts.

Figure 4. Reliability Framework



Source: NREL, infra note 42.

4 Per the North American Electric Reliability Corporation (NERC), resource adequacy is
5 defined as “the ability of the electric system to supply the aggregate electric power and
6 energy requirements of the electricity consumers at all times while taking into account
7 scheduled and reasonably expected unscheduled outages of system components.”⁴⁰
8 Resource adequacy is a longer-term planning metric measuring the ability of the system
9 to supply enough electricity, even during severe weather events and unscheduled
10 outages.

40 NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION, *2025 Summer Reliability Assessment* at 39 (May 2025), available at <http://bit.ly/4kLaBeJ>.

1 NERC defines operating reliability as “the ability of the electric system to withstand
2 sudden disturbances, such as electric short-circuits or unanticipated loss of system
3 components.”⁴¹ Operational reliability is a shorter-term metric that measures the
4 system’s ability to balance supply and demand in real time—including its ability to
5 respond to normal, random variations in demand and supply, as well as to respond to
6 failure of a large power plant or transmission line.

7 The concepts of operational reliability and resource adequacy do overlap, but resource
8 adequacy is focused on having sufficient available generation and transmission to meet
9 demand, while operational reliability focuses on how generators are operated in real
10 time.⁴²

11 The FERC defines resilience as “the ability to withstand and reduce the magnitude
12 and/or duration of disruptive events, which includes the capability to anticipate, absorb,
13 adapt to, and/or rapidly recover from such an event.”⁴³ While there is not a strict
14 delineation between resource adequacy and resilience, the two concepts emerge from
15 different planning contexts. While resource adequacy is based on historical weather data

41 *Id.*

42 NATIONAL RENEWABLE ENERGY LABORATORY, *Explained: Fundamentals of Power Grid Reliability & Clean Electricity* (January 2024), available at <http://bit.ly/4m59fwn>.

43 *Grid Reliability & Resilience Pricing*, 162 FERC ¶ 61,012 (January 8, 2018), available at <http://bit.ly/4eVm4H0>.

1 generally, resilience focuses on the most extreme, low-frequency, and high-impact
2 events with the potential to affect a large number of customers.⁴⁴

3 **Q Can weather-dependent renewable energy resources, paired with storage and**
4 **energy efficiency, help system reliability?**

5 A Yes. Pairing energy storage with renewable energy resources provides firming
6 capabilities, enabling clean energy to contribute to grid reliability during normal on- and
7 off-peak days, as well as during extreme weather events such as heat waves and cold
8 snaps. For example, rapid deployment of solar and battery storage in ERCOT has greatly
9 improved system flexibility and reliability. Over the last two years, Texas' solar
10 generation has doubled, and battery storage has quadrupled. Last year, ERCOT
11 predicted that the grid had a 16 percent chance of entering a power demand emergency
12 during hours where demand remained high after the sun set. This year, ERCOT predicts
13 a 0.5 percent chance of having an emergency during the same hours.⁴⁵

14 **Q Are there any reliability concerns with combustion turbines such as CERC?**

15 A Yes. Gas plants are not perfectly reliable resources and are prone to weather-correlated
16 forced outages. For example, during Winter Storm Elliott, 63 percent of all outages were

44 NATIONAL RENEWABLE ENERGY LABORATORY, *Explained: Fundamentals of Power Grid Reliability & Clean Electricity*, *supra* note 42.

45 REFORMAUSTIN, *Texas Grid Strengthens Ahead of Scorching Summer, Thanks to Renewables* (June 25, 2025), available at <http://bit.ly/3IByrw2>.

1 natural gas.⁴⁶ In contrast, wind and solar resources performed as the near-term forecasts
2 projected.⁴⁷ During Winter Storm Uri, un-winterized gas plants across the state of Texas
3 made up 58 percent of unplanned outages.⁴⁸ Furthermore, gas plant performance is
4 contingent on having a firm fuel supply. Absent a firm gas supply contract, fuel supply
5 constraints can limit the reliability contributions of gas plants.

6 Large, centralized power plants can also lead to worse system resiliency compared to
7 smaller, distributed resources such as solar and storage because they represent larger
8 potential contingencies relative to more modular resources. Larger capacity resources
9 therefore require greater operating reserves, in the event that they experience an
10 unplanned outage.

11 Ultimately, no resource provides perfect capacity, and all resources have their own
12 reliability challenges. The perception that gas turbines are always available to contribute
13 to system reliability and that they are the only resources that are able to help with
14 reliability is flawed. Dominion should robustly consider how it can meet its resource
15 needs by considering all potential options, rather than relying on a default approach of
16 building new combustion turbines.

46 PJM INTERCONNECTION, *Winter Storm Elliott Frequently Asked Questions* (April 12, 2023), available at <http://bit.ly/4eZfAa4>.

47 *Id.*

48 Leticia Gonzales, *Natural Gas Issues Blamed for Lion's Share of Winter Uri Outages, Say Federal Regulators*, NATURAL GAS INTELLIGENCE (November 18, 2021), available at <http://bit.ly/40Yte7B>.

5.1. Dominion's Reliability Analyses

1 **Q Please describe the reliability analyses that Dominion conducted.**

2 A As I summarized in Section 3, Dominion presented two reliability analyses as part of its
3 application: (1) a 2030 cold snap analysis and (2) the Brattle study. Both studies share
4 similar flaws in that they remove CERC in its entirety without modeling any replacement
5 resources.

6 **Q Please describe the Dominion cold snap analysis.**

7 A In the cold snap analysis, Dominion assessed whether a baseline portfolio without CERC
8 would be capable of serving 2030 load levels over a 72-hour period with weather
9 conditions similar to the January 2025 cold snap. Dominion's modeled portfolio did not
10 include any incremental battery storage or solar additions to replace the CERC capacity
11 that was removed.⁴⁹ The Company did not optimize battery storage discharge in this
12 analysis; rather it assumed that all batteries discharged following the same pattern based
13 on operational data from the Company's Dry Bridge storage facility.⁵⁰ Dominion did not
14 conduct this analysis for any alternative portfolios that replaced the CERC capacity.⁵¹
15 The results showed that absent any new gas-fired resources, any alternative resource
16 additions, or any additional energy efficiency savings, the January 2025 weather
17 conditions would result in 8,993 MWh of unserved energy over the 72-hour modeled

49 Crabtree Direct at 23.

50 Dominion Response to Appalachian Voices Request No. 2-4(b) (enclosed as Exhibit DG-4).

51 Dominion Response to Appalachian Voices Request No. 2-2 (enclosed as Exhibit DG-5).

1 period.⁵² This result is not surprising, considering that Dominion removed CERC in its
2 entirety and modeled no replacement resources.

3 **Q Please describe the Brattle reliability study.**

4 A In the Brattle study, the Company compared the reliability of a baseline scenario
5 including CERC to a “no new gas” scenario that excluded CERC. The “no new gas”
6 scenario also excluded clean firm resources, which were included in Brattle’s baseline
7 scenario to represent virtual power plants, data center backup generation, multiday
8 storage, or other non-duration limited firm capacity. The “no new gas” scenario used
9 the same build limits as the Dominion 2024 IRP, meaning the model was not able to
10 replace the CERC capacity with any additional quantities of storage or other resources.
11 Brattle developed 29 three-day weather periods that included hourly assumptions around
12 load and resource availability. Twenty-six of these periods were based on a limited range
13 of weather conditions, including representative on-peak and off-peak periods, but
14 excluding more extreme weather scenarios. Three of the periods were based on extreme
15 weather periods, including heat wave and cold snap periods over the past 25 years.⁵³ This
16 analysis showed that the “no new gas” portfolio would result in capacity violations in six
17 of the 29 scenarios and energy violations in one of the extreme weather scenarios.⁵⁴

52 Crabtree Direct at 24.

53 Sheilendranath Direct at 7.

54 *Id.* at 13.

1 **Q Do you have any concerns with the scenario frameworks underlying Dominion and**
2 **Brattle’s reliability analyses?**

3 A Yes. The alternative portfolios that both Dominion and Brattle modeled in their
4 reliability analyses fail on two key issues: (1) the analysis does not replace CERC’s
5 capacity with replacement resources; and (2) it does not, at a minimum, include energy
6 efficiency portfolios consistent with Commission-directed targets.

7 In Dominion’s modeled alternative scenarios, the Company simply removes CERC and
8 replaces it with nothing. It should be obvious that a portfolio that does not meet the
9 Company’s firm capacity needs would also not meet its reliability needs. By failing to
10 evaluate the reliability of alternative portfolios that actually replace CERC’s firm
11 capacity, the Company is not adequately considering whether it can use alternative
12 resources to meet its reliability needs. The Company qualitatively claims that weather-
13 dependent renewable resources cannot be used to meet its reliability needs,⁵⁵ but its
14 Application altogether lacks any quantitative analysis of the reliability of alternative
15 portfolios that include higher levels of renewable energy, paired with storage and DSM
16 measures.

17 Additionally, both reliability analyses relied on Dominion’s 2024 IRP load forecast,
18 whose levels of energy savings are non-compliant with statutory targets. Neither analysis
19 considered the reliability impacts of increased levels of energy efficiency investment.

55 Direct Testimony of William A. Coyle (Coyle Direct) at 7.

1 **Q Please explain your concerns around Dominion’s energy efficiency assumptions.**

2 A Dominion’s baseline modeling does not include energy efficiency sufficient to meet
3 Commission-directed targets of three (3) percent in 2026, four (4) percent in 2027, and
4 five (5) percent in 2028.⁵⁶ Instead, Dominion’s baseline energy efficiency assumptions
5 are consistent with its proposed targets in Docket PUR-2023-00227.⁵⁷ This is a savings
6 of 2.09 percent, 2.39 percent, and 2.72 percent in 2026, 2027, and 2028 (once again,
7 percentages are described as a cumulative energy efficiency savings relative to 2019
8 sales).⁵⁸ By omitting incremental energy efficiency from its modeling, Dominion is
9 ignoring the reliability impacts of increased investment in energy efficiency.

10 **Q Please summarize your conclusions around Dominion’s reliability modeling.**

11 A The alternative scenario that Dominion modeled—without CERC—serves as a
12 completely unhelpful and uninformative alternative. To receive a variance from
13 Commission-directed energy efficiency requirements Dominion should be
14 demonstrating that a portfolio with less energy efficiency and CERC is more reliable than

56 *See* Dominion EE Targets Final Order, *supra* note 4.

57 *Commonwealth ex rel. State Corporation Commission in re: Virginia Electric & Power Company’s 2024 Integrated Resource Plan Pursuant to Virginia Code § 56-697 et seq.*, Case No. PUR-2024-00184, 2024 Integrated Resource Plan Report, Appendix 3D at 1 (October 15, 2024), available at <http://bit.ly/3IEuOp5> (2024 IRP).

58 *See Commonwealth ex rel. State Corporation Commission in re: Establishing Energy Efficiency Savings Targets for Virginia Electric & Power Company Pursuant to Virginia Code §§ 56-596.2 B 3 and 56-597.2:2*, Case No. PUR-2023-00227, Final Order (February 27, 2025), available at <http://bit.ly/4IHg8nQ>.

1 a portfolio with more energy efficiency and either CERC or any alternatives. Dominion
2 has *not* provided such an analysis.

5.2. Synapse's Reliability Analysis

3 **Q Please describe the reliability modeling exercise that you completed.**

4 A I largely replicated the reliability analysis framework and methodology that Brattle used
5 for its study. I assessed the reliability of a baseline portfolio, as well as the two alternative
6 portfolios (Half and Full CERC Replacement) that are discussed in the Synapse
7 economic analysis section above.

8 Using EnCompass, I conducted hourly modeling of the PJM region to assess whether the
9 alternative portfolios would be capable of serving load and meeting hourly available
10 capacity requirements, under the same weather conditions that Brattle modeled in its
11 study. I relied on the resource builds from the capacity expansion modeling that I used to
12 conduct the economic analysis described in Section 4. I used Brattle's hourly load shape
13 and resource availability profiles⁵⁹ to model the performance of each portfolio in

59 Dominion Response to Sierra Club Request No. 2-3, Attachment Sierra Club 02-03 (AS). Dominion Response to Sierra Club Request No. 2-3 is enclosed as Exhibit DG-6. Attachment Sierra Club 02-03 (AS) includes voluminous spreadsheet data and can be provided upon request.

1 EnCompass under each of Brattle’s 29 three-day weather periods. I also used the same
2 4.4 percent operating reserve margin requirement as Brattle.⁶⁰

3 I reduced the hourly load profile in the Synapse alternative portfolios by the incremental
4 energy efficiency adjustments I used in the economic analysis described above and
5 assumed that the energy efficiency load reductions are constant in each hour of the year.
6 My analysis focused on assessing reliability in 2032 and 2036. While Brattle modeled
7 2028, 2032, 2036, and 2040, I left out 2028 since this is prior to CERC’s online date and
8 2040 because it was beyond the IRP planning period and therefore beyond the timeline
9 of most of my input data.

10 **Q Please describe the results of your reliability analysis.**

11 A I found that none of my modeled portfolios—Baseline, Half CERC Replacement, nor
12 Full CERC Replacement—had any significant reliability problems as measured by
13 energy and capacity violations. I use the same definitions as Brattle for these metrics
14 (energy violations are defined as hours where the model is unable to serve hourly
15 demand, and capacity violations are defined as hours where the model is unable to meet
16 an hourly operating reserve margin of 4.4 percent).⁶¹

60 Sheilendranath Direct at 14; *see also* Exhibit DG-3 (Dominion Response to Sierra Club Request No. 3-2).

61 *Id.*

1 Specifically, none of the three portfolios had any energy violations. This means that each
2 portfolio was capable of serving load in each hour. For weather period scenario numbers
3 1–28, I also found that none of my modeled portfolios had any capacity violations,
4 meaning each portfolio was capable of meeting operational reliability requirements in
5 each hour.

6 For weather scenario 29 only (one of the three extreme weather condition periods), I
7 found that all of my modeled portfolios, including the Baseline portfolio with CERC, had
8 minor capacity violations in a handful of hours in 2032. By 2036, the Baseline portfolio
9 has greater capacity violations than the alternative portfolios. Table 6 summarizes the
10 reliability results for each portfolio under the weather scenario 29, including the number
11 of capacity violations, the total quantity of capacity violations (MWh), the maximum
12 hourly capacity violation (MW), and the minimum hourly operating reserve margin (% of
13 hourly demand) of each portfolio in 2032 and 2036.

14 In 2032, the Baseline portfolio and my replacement portfolios have similar total capacity
15 violations over the three-day period, with the Baseline having more hours with
16 violations, but slightly smaller magnitude violations relative to the alternatives. By 2036,
17 the Baseline scenario has 10 hours with capacity violations (out of 72 hours total), 6,206
18 MWh of total capacity violations, with a maximum hourly capacity violation of 1,677. In
19 contrast, my replacement portfolios only have 4 hours with capacity violations and much
20 lower maximum violations and total sum violations. In 2032, the Baseline has a minimum
21 hourly operating reserve of 3.2 percent, while my replacement portfolios have minimum
22 reserves of 3.1 percent and 2.6 percent. By 2036, the Baseline has a minimum hourly

1 operating reserve of -3 percent (meaning available capacity is 3 percent less than hourly
2 demand), while my replacement portfolios have minimum operating reserves of 2.4
3 percent and 2.5 percent.

**Table 6. Capacity Violation Results from Synapse Reliability
Modeling of Weather Scenario 29**

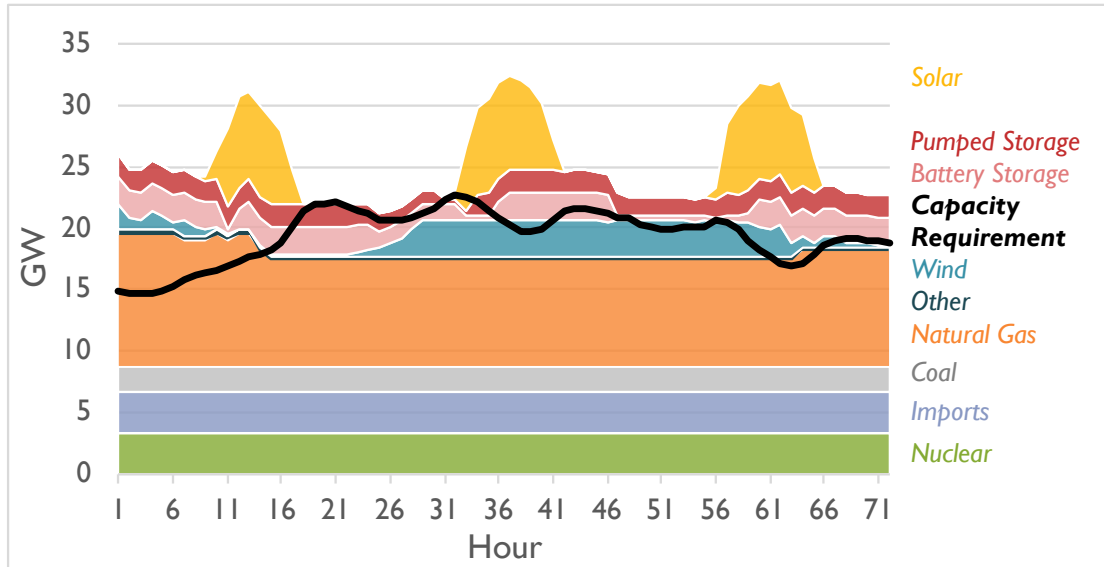
		Number of Capacity Violations*	Sum of Total Capacity Violations (MWh)	Max Hourly Capacity Violation (MW)	Minimum Hourly Operating Reserve (%)
2032	Baseline	3	438	261	3.2%
	Half CERC Replacement	1	255	255	3.1%
	Full CERC Replacement	1	367	367	2.6%
2036	Baseline	10	6,206	1,677	-3.0%
	Half CERC Replacement	4	875	439	2.4%
	Full CERC Replacement	4	582	414	2.5%

* Note: Capacity violations are defined as hours where the model is not able to meet the hourly operating reserve requirement.

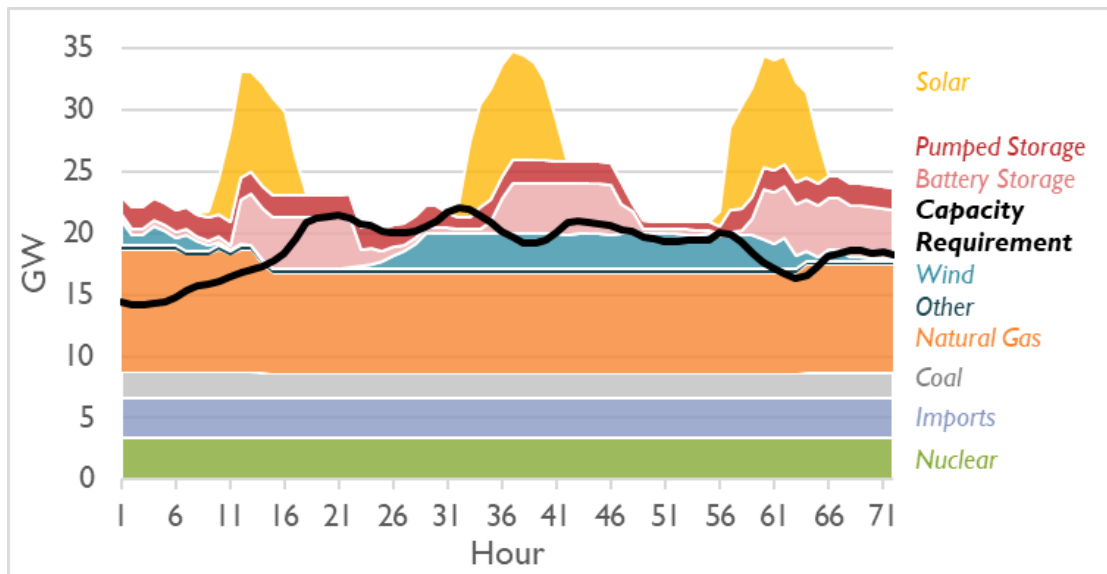
4 **Q How does hourly generation and available capacity compare across your modeled**
5 **portfolios for this extreme weather scenario with capacity violations?**

6 A Figure 5 and Figure 6 show the hourly available capacity for the Baseline and Full CERC
7 Replacement portfolio respectively in 2032. Figure 7 and Figure 8 show the hourly
8 generation for the Baseline and Full CERC Replacement portfolio respectively in 2032.

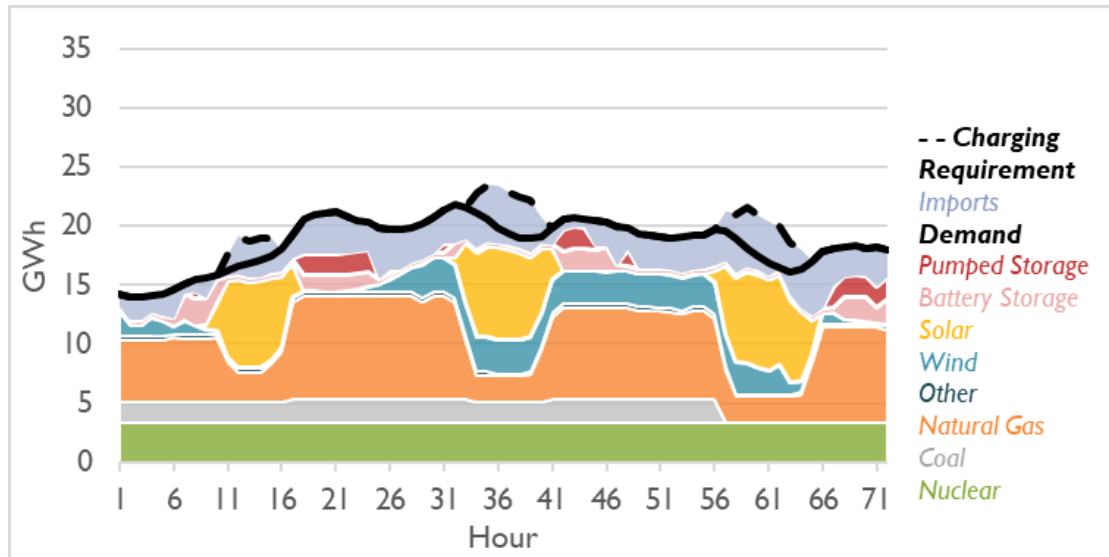
**Figure 5. Available Capacity, Baseline Portfolio, 2032
(Weather Scenario No. 29)**



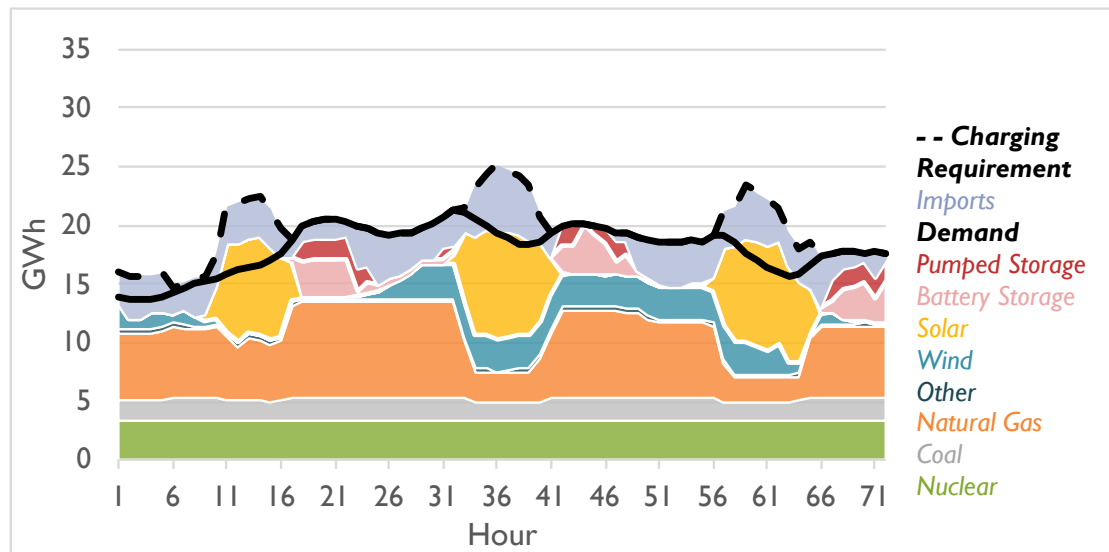
**Figure 6. Available Capacity, Full CERC Replacement Portfolio, 2032
(Weather Scenario No. 29)**



**Figure 7. Generation & Load, Baseline Portfolio, 2032
(Weather Scenario No. 29)**



**Figure 8. Generation & Load, Full CERC Replacement Portfolio, 2032 Extreme
(Weather Scenario No. 29)**



- 1 In the Full CERC Replacement portfolio, the incremental solar and storage resources
- 2 work together to provide energy and available capacity during the initial 13-hour lull in
- 3 offshore wind generation that occurs during the first day. Then, the incremental solar
- 4 paired with the additional batteries allows the batteries to fully charge during the middle

1 of the day when there is surplus generation. This enables the batteries to provide
2 available capacity and energy through the afternoon into the evening. Over the three-day
3 period, the Full CERC Replacement portfolio also imports less energy than the Baseline
4 portfolio (200 GWh down from 211 GWh).

5 **Q Why do your replacement portfolios have better reliability performance than the**
6 **Baseline scenario?**

7 A My replacement portfolios perform slightly better because of the combination of energy
8 efficiency reducing the hourly reliability requirement and solar and battery storage
9 resources working together. My replacement portfolios contain sufficient solar for the
10 additional batteries to fully charge during the day and not be energy-constrained,
11 enabling the batteries to provide available capacity long into the evening, after the solar
12 stops generating.

13 **Q What are the implications of the capacity violations that occur in this extreme**
14 **weather scenarios?**

15 A While it is not ideal to have a lower operational reserve margin than the modeled 4.4
16 percent requirement, it is not necessarily the case that PJM will shed load in these
17 instances, as Brattle claims might happen.⁶² According to PJM's independent market
18 monitor, in 2024 there were 39 periods with 5-minute shortage pricing over 17 days. PJM
19 uses a shortage pricing mechanism to provide price incentives during impacted five-

62 Sheilendranath Direct at 14.

1 minute intervals where there is a shortage in operational reserves, effectively
2 corresponding to the capacity violation events defined by Brattle.⁶³ None of these periods
3 corresponded with any emergency warning or action.⁶⁴

4 There will always be a tradeoff between building a perfectly reliable system and system
5 cost. Capacity violations occurring in the one most extreme scenario, out of 29 total
6 scenarios, is not necessarily an indicator that a portfolio needs more supply-side capacity.
7 Even in this extreme scenario, there are no energy violations, meaning the portfolios are
8 all able to serve load in each hour. This is an extreme event, and the Company should
9 consider whether there are alternative measures it could take to procure operational
10 reserves in these instances. For example, data centers may be able to provide load
11 flexibility or utilize backup generation. Given the high quantity of data centers in
12 Dominion's load forecast, even a small percentage of load flexibility for a few hours a
13 year could be sufficient to resolve these capacity violations.

14 **Q Is there precedent for mandatory or voluntary demand response programs for data**
15 **centers or other large loads to address reliability issues that are driven by data**
16 **center load growth?**

17 A Yes. High data center load growth in Texas has led to concerns about future reliability
18 problems. In response, Texas recently passed Senate Bill 6, which includes a mandatory

63 PJM, *Shortage Pricing*. (2024), available at <http://bit.ly/4m7mNqZ>.

64 MONITORING ANALYTICS, *2024 State of the Market Report for PJM* (March 13, 2025), available at <http://bit.ly/3GVhMmv>.

1 curtailment program and a voluntary demand response procurement program, under
2 which loads of 75 MW or more can either ramp down their energy use or switch to
3 backup generation at the utility's request.⁶⁵

4 **Q What should the Commission take away from your modeling?**

5 A Gas combustion turbines are not the only resource option that can reliably serve load
6 under a range of weather conditions. Increased energy efficiency investment can reduce
7 the hourly energy and operational reserve requirements (which are a percentage of
8 hourly load), acting to improve reliability. Replacement portfolios that contain sufficient
9 additional quantities of renewable energy paired with battery storage are capable of
10 meeting the same energy and available capacity needs that Dominion is seeking from
11 CERC.

12 **Q What are your key findings and recommendations?**

13 A The replacement portfolios I modeled are reliable, similar in cost, cleaner, and VCEA-
14 complaint, all while lowering peak load through incremental energy efficiency
15 investment. Dominion should conduct updated reliability modeling with an updated
16 energy efficiency trajectory and model alternative portfolios that don't just remove
17 CERC but actually replace it with viable alternatives. Dominion should not just write off
18 solar because of its weather dependence but rather should robustly consider the quantity

65 Brian Martucci, *Texas Law Gives Grid Operator Power to Disconnect Data Centers During Crisis*, *supra* note 32.

1 of additional solar, storage, and DSM measures that, combined, would be able to serve
2 its reliability needs.

6. OTHER RISKS OF CERC

3 **Q What risks is the Company exposing ratepayers to from its planned expanded**
4 **dependence on gas?**

5 A Dominion's intention to maintain and expand its portfolio of gas exposes its ratepayers
6 to fuel price volatility and potential for sizeable additional expenses from future
7 regulations.

8 **Q How is Dominion's generation mix expected to change going forward based on its**
9 **most recent IRP and CERC modeling?**

10 A From 2021-2023, natural gas resources made up 43-47 percent of Dominion's firm
11 capacity.⁶⁶ Based on the Company's IRP modeling, and the updated economic modeling
12 that Dominion conducted for this CPCN application, Dominion is projecting that it will
13 increase its reliance on gas, with gas generators represents 47-57 percent of its firm
14 capacity over the 2025-2039 period.⁶⁷ Dominion's recent historical, and forward-looking
15 continued substantial reliance on natural gas is concerning due to the volatile nature of
16 gas fuel prices. By proposing new gas plants to meet energy and capacity needs, as

66 Dominion 2024 IRP, Appendix 3B-6 (Existing Capacity for VCEA with EPA).

67 Dominion 2024 IRP, Appendix 3B-7 (Energy Generation by Type for VCEA with EPA);
Dominion Response to Sierra Club Request No. 4-1, Attachment Sierra Club 04-01(b)
(KLC) ES.

1 opposed to clean energy resources (which do not rely on ongoing fuel purchases),
2 Dominion is exposing its ratepayers to increased financial risk.

3 **Q Explain the risks posed to ratepayers by fuel price volatility.**

4 A High reliance on gas resources can expose ratepayers to fuel price volatility for which
5 ratepayers cannot plan. Gas is a global commodity, which means that both domestic and
6 global market forces can impact the price and demand for the resource. After roughly
7 doubling from 2019 to 2023, North American liquid natural gas export capacity is
8 projected to double again by 2028, from current levels of 11.4 billion cubic feet per day to
9 more than 24 billion cubic feet per day in 2028.⁶⁸ To put this in perspective, U.S. total
10 gas consumption in 2023 averaged roughly 89 billion cubic feet per day.⁶⁹ The global
11 market consumption effect on prices in the United States will continue to increase
12 significantly over even just the next few years.

13 When the market is constrained and prices spike, those costs are passed directly to
14 ratepayers. This happened in 2022 when Russia invaded Ukraine and European gas
15 customers turned increasingly to U.S. gas. This drove up domestic gas prices, and those
16 high costs were passed on directly to ratepayers. In PUR-2021-00097 and PUR-2022-

68 Victoria Zaretskaya, *North America's LNG Export Capacity is on Track to More than Double by 2028*, ENERGY INFORMATION ADMINISTRATION (December 30, 2024), available at <http://bit.ly/4lEB2nC>.

69 ENERGY INFORMATION ADMINISTRATION, *Natural Gas Consumption by End Use* (July 2025), available at <http://bit.ly/40uQOc6>.

1 00064,⁷⁰ Dominion projected that natural gas fuel costs would average around
2 \$32.99/MWh for the period January 2022 – December 2022. The Company’s actual fuel
3 costs for 2022 were 60 percent higher than projected at \$52.66/MWh.⁷¹ This resulted in
4 Dominion incurring over \$500 million more than projected in natural gas costs during
5 calendar year 2022.⁷² This type of disruption is likely to happen again, and Dominion
6 should take this into account when considering bringing CERC online and increasing gas
7 resources in its resource mix. Reducing its reliance on fossil resources is the best way to
8 protect its ratepayers from these future gas price volatility risks.

9 **Q How does Dominion’s build plan impact regulatory uncertainty and risk to**
10 **environmental compliance?**

11 A The cost of operating Dominion’s existing fossil resources is still high and the regulatory
12 risk they face is real. Gas units such as CERC will face uncertain regulatory and
13 environmental compliance costs from existing federal and state rules, and new rules
14 further out into the future. This regulatory uncertainty poses a substantial risk to
15 ratepayers. The Section 111 Rules may be repealed in their current form. But while prior

70 *Application of Virginia Electric & Power Company to Revise its Fuel Factor*, Case No. PUR-2021-00097, AKP Schedule 2 (2021 Fuel Factor), available at <http://bit.ly/451Sn2C>; *Application of Virginia Electric & Power Company to Revise its Fuel Factor*, Case No. PUR-2022-00064, KEF Schedule 2 (2022 Fuel Factor), available at <http://bit.ly/3UwPO3C>.

71 2022 Fuel Factor, KEF Schedule 8; *Application of Virginia Electric & Power Company to Revise its Fuel Factor Pursuant to Virginia Code § 56-249.6*, Case No. PUR-2023-00067, KEF Schedule 10 (2023 Fuel Factor), available at <http://bit.ly/4o4RE9p>.

72 2021 Fuel Factor, AKP Schedule 2; 2022 Fuel Factor KEF Schedules 2 and 8; 2023 Fuel Factor, KEF Schedule 10.

1 administrations have weakened the Section 111 programs designed by their predecessors,
2 they have nonetheless acknowledged a continuing duty to implement some form of
3 federal carbon regulation.⁷³ Given that some form of carbon regulation is likely, even at
4 the federal level during the modeled study period, the current Section 111 Rules serve as
5 a reasonable proxy for the combined effect of federal and state programs—including
6 Virginia’s participation in the Regional Greenhouse Gas Initiative (RGGI)—that
7 substantially increases the cost of dispatching and operating carbon-emitting resources.⁷⁴

8 **Q What risks does Dominion face from reliance on gas resources such as CERC?**

9 A As discussed above, firm gas pipeline capacity is constrained in Dominion’s service area.
10 Any new gas resource without a firm supply of fuel is not actually a firm resource unless
11 it can also operate on oil. The Company indicated in its 2024 IRP that the Company’s
12 gas-fired generation fleet is located in a fully subscribed pipeline corridor with pipeline
13 constraints and associated restrictions.⁷⁵ Dominion also indicated that it is reviewing

73 See generally Repeal of the Clean Power Plan; Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guidelines Implementing Regulations, 84 Fed. Reg. 32520 (July 8, 2019).

74 The Commission recently noted that Virginia’s participation in RGGI remains “uncertain.” See *Commonwealth ex rel. State Corporation Commission in re: Virginia Electric & Power Company’s Integrated Resource Plan Filing*, Case No. PUR-2024-00184, Final Order at 6 (July 15, 2025), available at <http://bit.ly/3H2cSUM>.

75 Dominion 2024 IRP, Appendix 5B at 1–2, available at <http://bit.ly/3IEuOp5>; see also *Commonwealth ex rel. State Corporation Commission in re: Virginia Electric & Power Company’s 2024 Integrated Resource Plan Pursuant to Virginia Code § 56-697 et seq.*, Case No. PUR-2024-00184, Dominion Response to Staff Request No. 7-154(k) (enclosed as Exhibit DG-7).

1 proposals for additional firm transportation, pipeline storage, peaking services, and
2 onsite fueling.⁷⁶

3 **Q How is Dominion addressing the lack of firm gas capacity in its modeling?**

4 A Dominion assumes that CERC will have onsite secondary fuel oil⁷⁷ and operate on oil-
5 only in winter given the constraints in gas pipelines.⁷⁸ Compared to gas-fired operation,
6 oil-fired operation is four-to-six times more expensive and has higher emissions. Overall,
7 reliance on oil is a bad long-term strategy—especially when there are cost-effective,
8 lower-cost, and lower-risk alternatives. The Company indicated that it plans to have a
9 firm gas contract in place for the plant but provided no further information on timing or
10 cost.⁷⁹

11 **Q What are your main takeaways from this CPCN Application and the economic and**
12 **reliability analyses that the Company and Synapse performed?**

13 A Dominion claims that it needs the CERC project to ensure reliability, and that the CERC
14 project is the only viable resource to meet its needs by 2030.⁸⁰ A large part of this future
15 need is driven by data center load growth in Dominion service territory. But the
16 Company's response to maintain its aging and uneconomic legacy plants, increase its

76 *Id.*

77 Miscikowski Direct at 3.

78 Dominion 2024 IRP, Appendix 5B at 1–2, available at <http://bit.ly/3IEuOp5>.

79 Dominion Response to Sierra Club Request No. 4-2 (enclosed as Exhibit DG-8).

80 Application at 5.

1 reliance on gas resources – such as through the proposed CERC Project – and to request
2 for a waiver from compliance with Commission-ordered energy efficiency requirements
3 is concerning. Especially as the natural gas generation industry is facing substantial
4 supply-chain challenges, as well as fully subscribed regional gas pipelines.

5 My modeling shows that a portfolio with increased energy efficiency investment will
6 lower system peak load and improve reliability over a portfolio with the CERC project.
7 To address reliability, Dominion should first increase its investment in energy efficiency
8 to levels in compliance with statutory requirements and Commission orders. The
9 Company should then critically evaluate the findings from its IRP that show that the
10 model builds the maximum quantity of solar and battery storage as soon as it is allowed.
11 My modeling shows that Dominion can meet its energy, capacity, and reliability needs
12 with an alternative portfolio of solar, storage, and energy efficiency that is equally if not
13 more reliable, for a comparable cost. This alternative portfolio reduces risk for current
14 and future ratepayers at a time of uncertainty and instability.

15 **Q Does this conclude your testimony?**

16 A Yes.

EXHIBIT DG-1
Resume of Devi Glick

Devi Glick, Senior Principal

Synapse Energy Economics | 485 Massachusetts Avenue, Suite 3 | Cambridge, MA 02139 | 617-453-7050
dglick@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Principal*, May 2022 – Present; *Principal Associate*, June 2021 – May 2022; *Senior Associate*, April 2019 – June 2021; *Associate*, January 2018 – March 2019.

Conducts research and provides expert witness and consulting services on energy sector issues.

Examples include:

- Modeling for resource planning using PLEXOS and Encompass utility planning software to evaluate the reasonableness of utility IRP modeling.
- Modeling for resource planning to explore alternative, lower-cost and lower-emission resource portfolio options.
- Providing expert testimony in rate cases on the prudence of continued investment in, and operation of, coal plants based on the economics of plant operations relative to market prices and alternative resource costs.
- Providing expert testimony and analysis on the reasonableness of utility coal plant commitment and dispatch practice in fuel and power cost adjustment dockets.
- Serving as an expert witness on avoided cost of distributed solar PV and submitting direct and rebuttal testimony regarding the appropriate calculation of benefit categories associated with the value of solar calculations.
- Reviewing and assessing the reasonableness of methodologies and assumptions relied on in utility IRPs and other long-term planning documents for expert report, public comments, and expert testimony.
- Evaluating utility long-term resource plans and developing alternative clean energy portfolios for expert reports.
- Co-authoring public comments on the adequacy of utility coal ash disposal plans, and federal coal ash disposal rules and amendments.
- Analyzing system-level cost impacts of energy efficiency at the state and national level.

Rocky Mountain Institute, Basalt, CO. August 2012 – September 2017

Senior Associate

- Led technical analysis, modeling, training and capacity building work for utilities and governments in Sub-Saharan Africa around integrated resource planning for the central electricity grid energy. Identified over one billion dollars in savings based on improved resource-planning processes.

-
- Represented RMI as a content expert and presented materials on electricity pricing and rate design at conferences and events.
 - Led a project to research and evaluate utility resource planning and spending processes, focusing specifically on integrated resource planning, to highlight systematic overspending on conventional resources and underinvestment and underutilization of distributed energy resources as a least-cost alternative.

Associate

- Led modeling analysis in collaboration with NextGen Climate America which identified a CO2 loophole in the Clean Power Plan of 250 million tons, or 41 percent of EPA projected abatement. Analysis was submitted as an official federal comment which led to a modification to address the loophole in the final rule.
- Led financial and economic modeling in collaboration with a major U.S. utility to quantify the impact that solar PV would have on their sales and helped identify alternative business models which would allow them to recapture a significant portion of this at-risk value.
- Supported the planning, content development, facilitation, and execution of numerous events and workshops with participants from across the electricity sector for RMI's Electricity Innovation Lab (eLab) initiative.
- Co-authored two studies reviewing valuation methodologies for solar PV and laying out new principles and recommendations around pricing and rate design for a distributed energy future in the United States. These studies have been highly cited by the industry and submitted as evidence in numerous Public Utility Commission rate cases.

The University of Michigan, Ann Arbor, MI. *Graduate Student Instructor*, September 2011 – July 2012

The Virginia Sea Grant at the Virginia Institute of Marine Science, Gloucester Point, VA. *Policy Intern*, Summer 2011

Managed a communication network analysis study of coastal resource management stakeholders on the Eastern Shore of the Delmarva Peninsula.

The Commission for Environmental Cooperation (NAFTA), Montreal, QC. *Short Term Educational Program/Intern*, Summer 2010

Researched energy and climate issues relevant to the NAFTA parties to assist the executive director in conducting a GAP analysis of emission monitoring, reporting, and verification systems in North America.

Congressman Tom Allen, Portland, ME. *Technology Systems and Outreach Coordinator*, August 2007 – December 2008

Directed Congressman Allen's technology operation, responded to constituent requests, and represented the Congressman at events throughout southern Maine.

EDUCATION

The University of Michigan, Ann Arbor, MI

Master of Public Policy, Gerald R. Ford School of Public Policy, 2012

Master of Science, School of Natural Resources and the Environment, 2012

Masters Project: *Climate Change Adaptation Planning in U.S. Cities*

Middlebury College, Middlebury, VT

Bachelor of Arts, 2007

Environmental Studies, Policy Focus; Minor in Spanish

Thesis: *Environmental Security in a Changing National Security Environment: Reconciling Divergent Policy Interests, Cold War to Present*

PUBLICATIONS

Glick, D., T. Gyalmo, D. Karabakal, L. Metz, C. Resor. 2024. *Review of Tennessee Valley Authority's Draft 2025 Integrated Resource Plan*. Synapse Energy Economics for Sierra Club.

Biewald, B., D. Glick, S. Kwok, K. Takahashi, J. Carvallo, L. Schwartz. 2024. *Best Practices in Integrated Resource Planning: A guide for planners developing the electricity resource mix of the future*. Synapse Energy Economics and Lawrence Berkeley National Laboratory for The Energy Foundation.

Kwok, S., D. Glick, R. Anderson, T. Gyalmo. 2023. *Review of Southwestern Public Service Company 2023 Integrated Resource Plan*. Synapse Energy Economics for Sierra Club.

Kwok, S., J. Smith, D. Glick. 2023. *Review of Cleco Power's 2021 IRP Report*. Synapse Energy Economics for Sierra Club.

Addleton, I., D. Glick, R. Wilson. 2021. *Georgia Power's Uneconomic Coal Practices Cost Customers Millions*. Synapse Energy Economics for Sierra Club.

Glick, D., P. Eash-Gates, J. Hall, A. Takasugi. 2021. *A Clean Energy Future for MidAmerican and Iowa*. Synapse Energy Economics for Sierra Club, Iowa Environmental Council, and the Environmental Law and Policy Center.

Glick, D., S. Kwok. 2021 *Review of Southwestern Public Service Company's 2021 IRP and Tolk Analysis*. Synapse Energy Economics for Sierra Club.

Glick, D., P. Eash-Gates, S. Kwok, J. Tabernero, R. Wilson. 2021. *A Clean Energy Future for Tampa*. Synapse Energy Economics for Sierra Club.

Glick, D. 2021. *Synapse Comments and Surreply Comments to the Minnesota Public Utility Commission in response to Otter Tail Power's 2021 Compliance Filing Docket E-999/CI-19-704*. Synapse Energy Economics for Sierra Club.

Eash-Gates, P., D. Glick, S. Kwok, R. Wilson. 2020. *Orlando's Renewable Energy Future: The Path to 100 Percent Renewable Energy by 2020*. Synapse Energy Economics for the First 50 Coalition.

Eash-Gates, P., B. Fagan, D. Glick. 2020. *Alternatives to the Surry-Skiffes Creek 500 kV Transmission Line*. Synapse Energy Economics for the National Parks Conservation Association.

Biewald, B., D. Glick, J. Hall, C. Odom, C. Roberto, R. Wilson. 2020. *Investing in Failure: How Large Power Companies are Undermining their Decarbonization Targets*. Synapse Energy Economics for Climate Majority Project.

Glick, D., D. Bhandari, C. Roberto, T. Woolf. 2020. *Review of benefit-cost analysis for the EPA's proposed revisions to the 2015 Steam Electric Effluent Limitations Guidelines*. Synapse Energy Economics for Earthjustice and Environmental Integrity Project.

Glick, D., J. Frost, B. Biewald. 2020. *The Benefits of an All-Source RFP in Duke Energy Indiana's 2021 IRP Process*. Synapse Energy Economics for Energy Matters Community Coalition.

Camp, E., B. Fagan, J. Frost, N. Garner, D. Glick, A. Hopkins, A. Napoleon, K. Takahashi, D. White, M. Whited, R. Wilson. 2019. *Phase 2 Report on Muskrat Falls Project Rate Mitigation, Revision 1 – September 25, 2019*. Synapse Energy Economics for the Board of Commissioners of Public Utilities, Province of Newfoundland and Labrador.

Camp, E., A. Hopkins, D. Bhandari, N. Garner, A. Allison, N. Peluso, B. Havumaki, D. Glick. 2019. *The Future of Energy Storage in Colorado: Opportunities, Barriers, Analysis, and Policy Recommendations*. Synapse Energy Office for the Colorado Energy Office.

Glick, D., B. Fagan, J. Frost, D. White. 2019. *Big Bend Analysis: Cleaner, Lower-Cost Alternatives to TECO's Billion-Dollar Gas Project*. Synapse Energy Economics for Sierra Club.

Glick, D., F. Ackerman, J. Frost. 2019. *Assessment of Duke Energy's Coal Ash Basin Closure Options Analysis in North Carolina*. Synapse Energy Economics for the Southern Environmental Law Center.

Glick, D., N. Peluso, R. Fagan. 2019. *San Juan Replacement Study: An alternative clean energy resource portfolio to meet Public Service Company of New Mexico's energy, capacity, and flexibility needs after the retirement of the San Juan Generating Station*. Synapse Energy Economics for Sierra Club.

Suphachalasai, S., M. Touati, F. Ackerman, P. Knight, D. Glick, A. Horowitz, J.A. Rogers, T. Amegroud. 2018. *Morocco – Energy Policy MRV: Emission Reductions from Energy Subsidies Reform and Renewable Energy Policy*. Prepared for the World Bank Group.

Camp, E., B. Fagan, J. Frost, D. Glick, A. Hopkins, A. Napoleon, N. Peluso, K. Takahashi, D. White, R. Wilson, T. Woolf. 2018. *Phase 1 Findings on Muskrat Falls Project Rate Mitigation*. Synapse Energy Economics for Board of Commissioners of Public Utilities, Province of Newfoundland and Labrador.

Allison, A., R. Wilson, D. Glick, J. Frost. 2018. *Comments on South Africa 2018 Integrated Resource Plan*. Synapse Energy Economics for Centre for Environmental Rights.

Hopkins, A. S., K. Takahashi, D. Glick, M. Whited. 2018. *Decarbonization of Heating Energy Use in California Buildings: Technology, Markets, Impacts, and Policy Solutions*. Synapse Energy Economics for the Natural Resources Defense Council.

Knight, P., E. Camp, D. Glick, M. Chang. 2018. *Analysis of the Avoided Costs of Compliance of the Massachusetts Global Warming Solutions Act*. Supplement to 2018 AESC Study. Synapse Energy Economics for Massachusetts Department of Energy Resources and Massachusetts Department of Environmental Protection.

Fagan, B., R. Wilson, S. Fields, D. Glick, D. White. 2018. *Nova Scotia Power Inc. Thermal Generation Utilization and Optimization: Economic Analysis of Retention of Fossil-Fueled Thermal Fleet to and Beyond 2030 – M08059*. Prepared for Board Counsel to the Nova Scotia Utility Review Board.

Ackerman, F., D. Glick, T. Vitolo. 2018. *Report on CCR proposed rule*. Prepared for Earthjustice.

Lashof, D. A., D. Weiskopf, D. Glick. 2014. *Potential Emission Leakage Under the Clean Power Plan and a Proposed Solution: A Comment to the US EPA*. NextGen Climate America.

Smith, O., M. Lehrman, D. Glick. 2014. *Rate Design for the Distribution Edge*. Rocky Mountain Institute.

Hansen, L., V. Lacy, D. Glick. 2013. *A Review of Solar PV Benefit & Cost Studies*. Rocky Mountain Institute.

TESTIMONY

Iowa Utilities Commission (Docket RPU-2025-0001): Cross Rebuttal Testimony of Devi Glick in MidAmerican Energy Company Application for a Determination of Ratemaking Principles. On behalf of the Environmental Intervenors. June 19, 2025.

Iowa Utilities Commission (Docket RPU-2025-0001): Direct Testimony of Devi Glick in MidAmerican Energy Company Application for a Determination of Ratemaking Principles. On behalf of the Environmental Intervenors. April 11, 2025.

Louisiana Public Service Commission (Docket No. U-37425): Direct Testimony of Devi Glick in the Application of Entergy Louisiana, LLC. for approval of generation and transmission resources proposed in connection with services to a significant customer project in north Louisiana, including proposed rider, and request for timely treatment. On behalf of Sierra Club. April 11, 2025.

Michigan Public Service Commission (Case No. U-21262): Direct Testimony of Devi Glick in the matter of the Application of Indiana Michigan Power Company for approval of a Power Supply Cost Recovery Plan and Factors (2025). On behalf of Attorney General Dana Nessel, Citizens Utility Board of Michigan, and Sierra Club. March 4, 2025.

Virginia State Corporation Commission (Case No. PUR-2024-00184): Direct Testimony of Devi Glick in re: Virginia Electric and Power Company's 2024 Integrated Resource Plan filing pursuant to Virginia Code to §56-597 *et seq.* On behalf of Sierra Club and NRDC. February 28, 2025.

Michigan Public Service Commission (Case No. U-21262): Direct Testimony of Devi Glick in the matter of the Application of Indiana Michigan Power Company for a Power Supply Cost Recovery Reconciliation proceeding for the 12-month period ended December 31, 2023. On behalf of the Michigan Attorney General, Sierra Club, and Citizens Utility Board of Michigan. October 16, 2024.

State of Vermont Public Utility Commission (Case No. 24-2945-PET): Direct testimony of Devi Glick in Petition of VT Real Estate Holdings 2 LLC (“Fair Haven Solar”) for a Certificate of Public Good, pursuant to 30 V.S.A. § 248, authorizing the installation and operation of a 20 MW solar electric generation facility off Airport Road in Fair Haven, Vermont to be known as the “Fair Haven Solar Project”. On behalf of VT Real Estate Holdings 2 LLC. September 17, 2024

Public Service Commission of South Carolina (Docket No. 2024-203-E): Direct Testimony of Devi Glick in Application of Kingstree East 230 for a certificate of environmental compatibility and public convenience and necessity for the construction and operation of a 249 MW AC solar and battery facility in Williamsburg County, South Carolina Pursuant to S.C.Code Ann. § 58-33-10 et. Seq., and request to proceed with initial construction work, S.C. Code Ann. § 58-33-110(7). On behalf of Kingstree East 230 LLC. August 9, 2024.

Indiana Utility Regulatory Commission (Cause No. 46038): Direct Testimony of Devi Glick in Petition of Duke Energy Indiana, LLC Pursuant to Indiana code §§ 8-1-2-42.7 and 8-1-2-61, for authority to modify its rate and changes. On behalf of Citizens Action Coalition of Indiana, Inc. July 11, 2024.

State of Vermont Public Utility Commission (Case No. 23-1447-PET): Rebuttal testimony of Devi Glick in the Petition of VT Real Estate Holdings 1 LLC for a Certificate of Public Good, pursuant to 30 V.S.A. § 248, for a 20 MW ground-mounted solar array in Shaftsbury, Vermont. On behalf of VT Real Estate Holdings 1 LLC (“Shaftsbury Solar”). Revised June 27, 2024.

State of Vermont Public Utility Commission (Case No. 23-1447-PET): Direct testimony of Devi Glick in the Petition of VT Real Estate Holdings 1 LLC (“Shaftsbury Solar”) for a Certificate of Public Good, pursuant to 30 V.S.A. § 248, authorizing the installation and operation of a 20 MW solar electric generation facility off Holy Smoke Road in Shaftsbury, Vermont to be known as the “Shaftsbury Solar Project”. On behalf of VT Real Estate Holdings 1 LLC (“Shaftsbury Solar”). Revised June 27, 2024.

Iowa Utilities Board (RPU-2023-002): Supplemental Testimony of Devi Glick in re: Interstate Power and Light Company, Proposed Rate Increase. On behalf of Environmental Intervenors. June 21, 2024.

Florida Public Service Commission (Docket No. 20240026-EI): Direct testimony of Devi Glick in petition for rate increase by Tampa Electric Company. On behalf of Sierra Club. June 6, 2024.

Iowa Utilities Board (RPU-2023-0002): Surrebuttal Testimony of Devi Glick in re: Interstate Power and Light Company, Proposed Rate Increase. On behalf of Environmental Intervenors. June 3, 2024.

Iowa Utilities Board (RPU-2023-0002): Direct Testimony of Devi Glick in re: Interstate Power and Light Company, Proposed Rate Increase. On behalf of Environmental Intervenors. April 16, 2024.

Michigan Public Service Commission (Case No. U-21051): Direct Testimony of Devi Glick in the Matter of the application of DTE Electric Company for reconciliation of its power supply cost recovery plan (Case No. U-21050) for the 12 months ended December 31, 2022. On behalf of Michigan Environmental Council. March 8, 2024.

Michigan Public Service Commission (Case No. U-21427): Direct Testimony of Devi Glick in the matter of the Application of Indiana Michigan Power Company for approval of a Power Supply Cost Recovery plan and factors (2024). On behalf of Sierra Club and Citizens Utility Board of Michigan. March 4, 2024.

Georgia Public Service Commission (Docket No. 55378): Direct Testimony of Devi Glick and Lucy Metz in Re: Georgia Power Company's 2023 Integrated Resource Plan Update. On behalf of Sierra Club. February 15, 2024.

Louisiana Public Service Commission (Docket No. U-36923): Direct Testimony of Devi Glick in the Application of Cleco Power LLC for: (1) Implementation of changes in rates to be effective July 1, 2024; and (2) extension of existing formula rate plan. On behalf of Sierra Club. February 5, 2024.

Public Service Commission of South Carolina (Docket No. 2023-154-E): Supplemental Testimony of Devi Glick in re: 2023 Integrated Resource Plan for the South Carolina Public Service Authority. On behalf of Sierra Club. January 29, 2024.

Public Service Commission of South Carolina (Docket No. 2023-154-E): Surrebuttal Testimony of Devi Glick in re: 2023 Integrated Resource Plan for the South Carolina Public Service Authority. On behalf of Sierra Club. November 17, 2023.

Public Utilities Commission of Ohio (Case No. 21-477-EL-RDR): Direct Testimony of Devi Glick in the Matter of the OVEC Generation Purchase Rider Audits Required by 4928.148 for Duke Energy Ohio, Inc. the Dayton Power and Light Company, and AEP Ohio. On behalf of Union of Concerned Scientists and the Citizens Utility Board. October 10, 2023.

Public Service Commission of South Carolina (Docket No. 2023-154-E): Direct Testimony of Devi Glick in re: 2023 Integrated Resource Plan for the South Carolina Public Service Authority. On behalf of Sierra Club. September 22, 2023.

Public Utilities Commission of Ohio (Case No. 20-165-EL-RDR): Direct Testimony of Devi Glick in the matter of the review of the Reconciliation Rider of the Dayton Power and Light Company. On behalf of Office of the Ohio Consumers' Counsel. September 12, 2023.

Virginia State Corporation Commission (Case No. PUR-2023-00066): Direct Testimony of Devi Glick in re: Virginia Electric and Power Company's 2023 Integrated Resource Plan filing pursuant to Virginia Code to §56-597 *et seq.* On behalf of Sierra Club. August 8, 2023.

Public Utility Commission of Texas (PUC Docket No. 54634): Direct Testimony of Devi Glick in the application of Southwestern Public Service Company for authority to change rates. On behalf of Sierra Club. August 4, 2023

Arizona Corporation Commission (Docket No. E-1345A-22-0144): Surrebuttal Testimony of Devi Glick in the matter of the application of Arizona Public Service Company for a hearing to determine the fair value of the utility property of the company for ratemaking purposes, to fix a just and reasonable rate of return thereon, and to approve rate schedules designed to develop such return. On Behalf of Sierra Club. July 26, 2023.

Arizona Corporation Commission (Docket No. E-01345A-22-0144): Direct Testimony of Devi Glick in the matter of the application of Arizona Public Service Company for a hearing to determine the fair value of the utility property of the company for ratemaking purposes, to fix a just and reasonable rate of return thereon, and to approve rate schedules designed to develop such return. On Behalf of Sierra Club. June 5, 2023.

Virginia State Corporation Commission (Case No. PUR-2023-00005): Direct Testimony of Devi Glick in the Petition of Virginia Electric & Power Company for revision of rate adjustment clause, Rider E, for the recovery of costs incurred to comply with state and federal environmental regulations pursuant to §56-585.1 A 5 e of the Code of Virginia. On behalf of Sierra Club. May 23, 2023.

New Mexico Public Regulation Commission (Case No. 22-00286-UT): Direct Testimony of Devi Glick in the matter of Southwestern Public Service Company's application for: (1) Revisions of its retail rates under advance no. 312; (2) Authority to abandon the Plant X Unit 1, Plant X Unit 2, and Cunningham Unit 1 Generating Stations and amend the abandonment date of the Tolk Generating Station; and (3) other associated relief. On behalf of Sierra Club. April 21, 2023.

Michigan Public Service Commission (Case No. U-20805): Direct Testimony of Devi Glick in the matter of the Application of Indiana Michigan Power Company for a Power Supply Cost Recovery Reconciliation proceeding for the 12-month period ended December 31, 2021. On behalf of Michigan Attorney General. April 17, 2023.

Michigan Public Service Commission (Case No. U-21261): Direct Testimony of Devi Glick in the matter of the application of Indiana Michigan Power Company for approval to implement a Power Supply Cost Recovery Plan for the twelve months ending December 31, 2023. On Behalf of Sierra Club. March 23, 2023.

New Mexico Public Regulation Commission (Case No. 19-00099-UT / 19-00348-UT): Direct Testimony of Devi Glick in the matter of El Paso Electric Company's Application for Approval of Long-Term Purchased Power Agreements with Hecate Energy Santa Teresa, LLC, Buena Vista Energy, LLC, and Canutillo Energy Center LLC. On Behalf of New Mexico Office of the Attorney General, January 23, 2023.

Arizona Corporation Commission (Docket No. E-01933A-22-0107): Direct Testimony of Devi Glick in the matter of the application of Tucson Electric Power Company for the establishment of just and reasonable rates and charges designed to realize a reasonable rate of return on the fair value of the properties of Tucson Electric Power Company devoted to its operations throughout the state of Arizona for related approvals. On Behalf of Sierra Club. January 11, 2023.

New Mexico Public Regulation Commission (Case No. 22-00093-UT): Direct Testimony of Devi Glick in the amended application for approval of El Paso Electric Company's 2022 renewable energy act plan pursuant to the renewable energy act and 17.9.572 NMAC, and sixth revised rate no. 38-RPS cost rider. On Behalf of New Mexico Office of the Attorney General, January 9, 2023.

Iowa Utilities Board (Docket No. RPU-2022-0001): Supplemental Direct and Rebuttal Testimony of Devi Glick in MidAmerican Energy Company Application for a Determination of Ratemaking Principles. On behalf of Environmental Intervenors. November 21, 2022.

Public Utility Commission of Texas (PUC Docket No. 53719): Direct Testimony of Devi Glick in the application of Entergy Texas, Inc. for authority to change rates. On behalf of Sierra Club. October 26, 2022.

Virginia State Corporation Commission (Case No. PUR-2022-00051): Direct Testimony of Devi Glick in re: Appalachian Power Company's Integrated Resource Plan filing pursuant to Virginia Code §56-597 *et seq.* On behalf of Sierra Club. September 2, 2022.

Public Service Commission of the State of Missouri (Case No. ER-2022-0129, Case No. ER-2022-0130): Surrebuttal Testimony of Devi Glick in the matter of Every Missouri Metro and Every Missouri West request for authority to implement a general rate increase for electric service. On behalf of Sierra Club. August 16, 2022.

Iowa Utilities Board (Docket No. RPU-2022-0001): Direct Testimony of Devi Glick in MidAmerican Energy Company Application for a Determination of Ratemaking Principles. On behalf of Environmental Intervenors. July 29, 2022.

Public Service Commission of the State of Missouri (Case No. ER-2022-0129, Case No. ER-2022-0130): Direct Testimony of Devi Glick in the matter of Every Missouri Metro and Every Missouri West request for authority to implement a general rate increase for electric service. On behalf of Sierra Club. June 8, 2022.

Virginia State Corporation Commission (Case No. PUR-2022-00006): Direct Testimony of Devi Glick in the petition of Virginia Electric & Power Company for revision of rate adjustment clause: Rider E, for the recovery of costs incurred to comply with state and federal environmental regulations pursuant to §56-585.1 A 5 e of the Code of Virginia. On behalf of Sierra Club. May 24, 2022.

Oklahoma Corporation Commission (Case No. PUD 202100164): Direct Testimony of Devi Glick in the matter of the application of Oklahoma gas and electric company for an order of the Commission authorizing application to modify its rates, charges, and tariffs for retail electric service in Oklahoma. On behalf of Sierra Club. April 27, 2022.

Public Utility Commission of Texas (PUC Docket No. 52485): Direct Testimony of Devi Glick in the application of Southwestern Public Service Company to amend its certifications of public convenience and necessity to convert Harrington Generation Station from coal to natural gas. On behalf of Sierra Club. March 25, 2022.

Public Utility Commission of Texas (PUC Docket No. 52487): Direct Testimony of Devi Glick in the application of Entergy Texas Inc. to amend its certificate of convenience and necessity to construct Orange County Advanced Power Station. On behalf of Sierra Club. March 18, 2022.

Michigan Public Service Commission (Case No. U-21052): Direct Testimony of Devi Glick in the matter of the application of Indiana Michigan Power Company for approval of a Power Supply Cost Recovery Plan and Factors (2022). On Behalf of Sierra Club. March 9, 2022.

Arkansas Public Service Commission (Docket No. 21-070-U): Surrebuttal Testimony of Devi Glick in the Matter of the Application of Southwestern Electric Power Company for approval of a general change in rate and tariffs. On behalf of Sierra Club. February 17, 2022.

New Mexico Public Regulation Commission (Case No. 21-00200-UT): Direct Testimony of Devi Glick in the Matter of the Southwestern Public Service Company's application to amend its certifications of public convenience and necessity to convert Harrington Generation Station from coal to natural gas. On behalf of Sierra Club. January 14, 2022.

Public Utilities Commission of Ohio (Case No. 18-1004-EL-RDR): Direct Testimony of Devi Glick in the Matter of the Review of the Power Purchase Agreement Rider of Ohio Power Company for 2018 and 2019. On behalf of the Office of the Ohio Consumer's Counsel. December 29, 2021.

Arkansas Public Service Commission (Docket No. 21-070-U): Direct Testimony of Devi Glick in the Matter of the Application of Southwestern Electric Power Company for Approval of a General Change in Rates and Tariffs. On behalf of Sierra Club. December 7, 2021.

Michigan Public Service Commission (Case No. U-20528): Direct Testimony of Devi Glick in the matter of the Application of DTE Electric Company for reconciliation of its power supply cost recovery plan (Case No. U-20527) for the 12-month period ending December 31, 2020. On behalf of Michigan Environmental Council. November 23, 2021.

Public Utilities Commission of Ohio (Case No. 20-167-EL-RDR): Direct Testimony of Devi Glick in the Matter of the Review of the Reconciliation Rider of Duke Energy Ohio, Inc. On behalf of The Office of the Ohio Consumer's Counsel. October 26, 2021.

Public Utilities Commission of Nevada (Docket No. 21-06001): Phase III Direct Testimony of Devi Glick in the joint application of Nevada Power Company d/b/a NV Energy and Sierra Pacific Power Company d/b/a NV Energy for approval of their 2022-2041 Triennial Intergrade Resource Plan and 2022-2024 Energy Supply Plan. On behalf of Sierra Club and Natural Resource Defense Council. October 6, 2021.

Public Service Commission of South Carolina (Docket No. 2021-3-E): Direct Testimony of Devi Glick in the matter of the annual review of base rates for fuel costs for Duke Energy Carolinas, LLC (for potential increase or decrease in fuel adjustment and gas adjustment). On behalf of the South Carolina Coastal Conservation League and the Southern Alliance for Clean Energy. September 10, 2021.

North Carolina Utilities Commission (Docket No. E-2, Sub 1272): Direct Testimony of Devi Glick in the matter of the application of Duke Energy Progress, LLC pursuant to N.C.G.S § 62-133.2 and commission

R8-5 relating to fuel and fuel-related change adjustments for electric utilities. On behalf of Sierra Club. August 31, 2021.

Michigan Public Service Commission (Docket No. U-20530): Direct Testimony of Devi Glick in the application of Indiana Michigan Power Company for a Power Supply Cost Recovery Reconciliation proceeding for the 12-month period ending December 31, 2020. On behalf of the Michigan Attorney General. August 24, 2021.

Public Utilities Commission of Nevada (Docket No. 21-06001): Phase I Direct Testimony of Devi Glick in the joint application of Nevada Power Company d/b/a NV Energy and Sierra Pacific Power Company d/b/a NV Energy for approval of their 2022-2041 Triennial Intergrade Resource Plan and 2022-2024 Energy Supply Plan. On behalf of Sierra Club and Natural Resource Defense Council. August 16, 2021.

North Carolina Utilities Commission (Docket No. E-7, Sub 1250): Direct Testimony of Devi Glick in the Matter of Application Duke Energy Carolinas, LLC Pursuant to §N.C.G.S 62-133.2 and Commission Rule R8-5 Relating to Fuel and Fuel-Related Charge Adjustments for Electric Utilities. On behalf of Sierra Club. May 17, 2021.

Public Utility Commission of Texas (PUC Docket No. 51415): Direct Testimony of Devi Glick in the application of Southwestern Electric Power Company for authority to change rates. On behalf of Sierra Club. March 31, 2021.

Michigan Public Service Commission (Docket No. U-20804): Direct Testimony of Devi Glick in the application of Indiana Michigan Power Company for approval of a Power Supply Cost Recovery Plan and factors (2021). On behalf of Sierra Club. March 12, 2021.

Public Utility Commission of Texas (PUC Docket No. 50997): Direct Testimony of Devi Glick in the application of Southwestern Electric Power Company for authority to reconcile fuel costs for the period May 1, 2017- December 31, 2019. On behalf of Sierra Club. January 7, 2021.

Michigan Public Service Commission (Docket No. U-20224): Direct Testimony of Devi Glick in the application of Indiana Michigan Power Company for Reconciliation of its Power Supply Cost Recovery Plan. On behalf of the Sierra Club. October 23, 2020.

Public Service Commission of Wisconsin (Docket No. 3270-UR-123): Surrebuttal Testimony of Devi Glick in the application of Madison Gas and Electric Company for authority to change electric and natural gas rates. On behalf of Sierra Club. September 29, 2020.

Public Service Commission of Wisconsin (Docket No. 6680-UR-122): Surrebuttal Testimony of Devi Glick in the application of Wisconsin Power and Light Company for approval to extend electric and natural gas rates into 2021 and for approval of its 2021 fuel cost plan. On behalf of Sierra Club. September 21, 2020.

Public Service Commission of Wisconsin (Docket No. 3270-UR-123): Direct Testimony and Exhibits of Devi Glick in the application of Madison Gas and Electric Company for authority to change electric and natural gas rates. On behalf of Sierra Club. September 18, 2020.

Public Service Commission of Wisconsin (Docket No. 6680-UR-122): Direct Testimony and Exhibits of Devi Glick in the application of Wisconsin Power and Light Company for approval to extend electric and natural gas rates into 2021 and for approval of its 2021 fuel cost plan. On behalf of Sierra Club. September 8, 2020.

Indiana Utility Regulatory Commission (Cause No. 38707-FAC125): Direct Testimony and Exhibits of Devi Glick in the application of Duke Energy Indiana, LLC for approval of a change in its fuel cost adjustment for electric service. On behalf of Sierra Club. September 4, 2020.

Indiana Utility Regulatory Commission (Cause No. 38707-FAC123 S1): Direct Testimony and Exhibits of Devi Glick in the Subdocket for review of Duke Energy Indian, LLC's Generation Unit Commitment Decisions. On behalf of Sierra Club. July 31, 2020.

Indiana Utility Regulatory Commission (Cause No. 38707-FAC124): Direct Testimony and Exhibits of Devi Glick in the application of Duke Energy Indiana, LLC for approval of a change in its fuel cost adjustment for electric service. On behalf of Sierra Club. June 4, 2020.

Arizona Corporation Commission (Docket No. E-01933A-19-0028): Reply to Late-filed ACC Staff Testimony of Devi Glick in the application of Tucson Electric Power Company for the establishment of just and reasonable rates. On behalf of Sierra Club. May 8, 2020.

Indiana Utility Regulatory Commission (Cause No. 38707-FAC123): Direct Testimony and Exhibits of Devi Glick in the application of Duke Energy Indiana, LLC for approval of a change in its fuel cost adjustment for electric service. On behalf of Sierra Club. March 6, 2020.

Public Utility Commission of Texas (PUC Docket No. 49831): Direct Testimony of Devi Glick in the application of Southwestern Public Service Company for authority to change rates. On behalf of Sierra Club. February 10, 2020.

New Mexico Public Regulation Commission (Case No. 19-00170-UT): Testimony of Devi Glick in Support of Uncontested Comprehensive Stipulation. On behalf of Sierra Club. January 21, 2020.

Nova Scotia Utility and Review Board (Matter M09420): Expert Evidence of Fagan, B, D. Glick reviewing Nova Scotia Power's Application for Extra Large Industrial Active Demand Control Tariff for Port Hawkesbury Paper. Prepared for Nova Scotia Utility and Review Board Counsel. December 3, 2019.

New Mexico Public Regulation Commission (Case No. 19-00170-UT): Direct Testimony of Devi Glick regarding Southwestern Public Service Company's application for revision of its retail rates and authorization and approval to shorten the service life and abandon its Tolk generation station units. On behalf of Sierra Club. November 22, 2019.

North Carolina Utilities Commission (Docket No. E-100, Sub 158): Responsive testimony of Devi Glick regarding battery storage and PURPA avoided cost rates. On behalf of Southern Alliance for Clean Energy. July 3, 2019.

State Corporation Commission of Virginia (Case No. PUR-2018-00195): Direct testimony of Devi Glick regarding the economic performance of four of Virginia Electric and Power Company's coal-fired units and the Company's petition to recover costs incurred to company with state and federal environmental regulations. On behalf of Sierra Club. April 23, 2019.

Connecticut Siting Council (Docket No. 470B): Joint testimony of Robert Fagan and Devi Glick regarding NTE Connecticut's application for a Certificate of Environmental Compatibility and Public Need for the Killingly generating facility. On behalf of Not Another Power Plant and Sierra Club. April 11, 2019.

Public Service Commission of South Carolina (Docket No. 2019-2-E): Surrebuttal testimony of Devi Glick in the Annual review of based rates for fuel costs for South Carolina Electric & Gas Company. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. March 29, 2019.

Public Service Commission of South Carolina (Docket No. 2019-2-E): Direct testimony of Devi Glick in the Annual review of based rates for fuel costs for South Carolina Electric & Gas Company. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. March 19, 2019.

Public Service Commission of South Carolina (Docket No. 2018-3-E): Surrebuttal testimony of Devi Glick regarding annual review of base rates of fuel costs for Duke Energy Carolinas. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. August 31, 2018.

Public Service Commission of South Carolina (Docket No. 2018-3-E): Direct testimony of Devi Glick regarding the annual review of base rates of fuel costs for Duke Energy Carolinas. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. August 17, 2018.

Public Service Commission of South Carolina (Docket No. 2018-1-E): Surrebuttal testimony of Devi Glick regarding Duke Energy Progress' net energy metering methodology for valuing distributed energy resources system within South Carolina. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. June 4, 2018.

Public Service Commission of South Carolina (Docket No. 2018-1-E): Direct testimony of Devi Glick regarding Duke Energy Progress' net energy metering methodology for valuing distributed energy resources system within South Carolina. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. May 22, 2018.

Public Service Commission of South Carolina (Docket No. 2018-2-E): Surrebuttal testimony of Devi Glick on avoided cost calculations and the costs and benefits of solar net energy metering for South Carolina Electric and Gas Company. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. April 4, 2018.

Public Service Commission of South Carolina (Docket No. 2018-2-E): Direct testimony of Devi Glick on avoided cost calculations and the costs and benefits of solar net energy metering for South Carolina Electric and Gas Company. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. March 23, 2018.

Resume updated May 2025

EXHIBIT DG-2

Dominion Response to

Sierra Club Request No. 3-4

Virginia Electric and Power Company
Case No. PUR-2025-00037
Sierra Club
Third Set

The following response to Question No. 4 of the Third Set of Interrogatories and Requests for Production of Documents propounded by Sierra Club received on May 13, 2025, was prepared by or under the supervision of:

Kenneth F. Mayer
Energy Market Strategic Advisor
Dominion Energy Services, Inc.

The following response to Question No. 4 subpart (d) of the Third Set of Interrogatories and Requests for Production of Documents propounded by Sierra Club received on May 13, 2025, was prepared by or under the supervision of:

Corey J. Riordan
Project Construction Controls Consultant
Dominion Energy Services, Inc.

Question No. 4

Refer to the economic analyses described in the Direct Testimony of Witness Crabtree starting on page 28.

- a. How did the Company determine the makeup of the Alternative Renewable Portfolio? Was it optimized using PLEXOS? If so, please provide any constraints around the optimization (i.e., any maximum build limits used). If it was not optimized, please explain why not and discuss whether the Company tested any other alternative portfolio.
- b. Did the Alternative Renewable Portfolio include any demand side management options? If so, please describe these assumptions. If not, please explain why the Company did not model an optimal alternative portfolio containing both demand side management and alternative renewable resources.
- c. Did the Company model any scenarios with a reduced capacity of combustion turbines, relative to the full size of the proposed CERC Project, combined with alternative resources? If so, please provide the results of this analysis. If not, please explain why not.
- d. Please provide all model input assumptions for the Company's economic analysis, including resource cost assumptions, build limits, and fuel costs. If there were any input assumptions that differed from the Company's 2024 IRP modeling, please describe what the differences were, provide the updated assumptions and explain why the Company decided to make those updates.
- e. Please provide all model outputs from the Company's economic analysis, including workbooks used to produce the NPV results summarized in Table 2.

Response:

- a. The Alternative Renewable Portfolio was designed to replace the approximate energy and ELCC-adjusted capacity value of the CERC Project throughout the duration of the Project.

This portfolio would be incremental to the 2024 IRP generic unit builds and would certainly violate annual build constraints assumed during the 2024 IRP.

- b. Please see Company Witness Crabtree's pre-filed direct testimony at pages 36-39 for a description of the economic analysis comparing CERC to demand side management options. The Company did not conduct an economic analysis against an additional alternative portfolio combining energy storage and demand-side management as the economic analyses were conducted in compliance with Virginia Code § 56-585.1 A 5 c, which requires a Commission finding that "supply-side resources are more cost-effective than demand-side or energy storage resources."
- c. No. The Company did not consider a "reduced capacity combustion turbine."
- d. Please see the Company's responses to APV Set 02-05 and APV Set 02-11(a). Please see also the Company's response to Sierra Club Set 02-01 (a)(i)-(vi).
- e. Please see the Company's response to Staff Set 02-12 for supporting information for Crabtree Table 2.

EXHIBIT DG-3

Dominion Response to

Sierra Club Request No. 3-2

Virginia Electric and Power Company
Case No. PUR-2025-00037
Sierra Club
Third Set

The following response to Question No. 2 of the Third Set of Interrogatories and Requests for Production of Documents propounded by Sierra Club received on May 13, 2025, was prepared by or under the supervision of:

Akarsh Sheilendranath
Principal
The Brattle Group

Question No. 2

Refer to the Direct Testimony of Witness Sheilendranath regarding the Brattle study.

- a. Please describe the gridSIM model topology used in the Brattle study. Confirm, or otherwise explain, that the model topology consisted of three zones including (1) DOM LSE, (2) DOM zone and PJM. Are these zones modeled in a nested structured, or are the DOM zone and PJM zones exclusive of the sub-zones? What level of granularity is used to model the rest of PJM, outside of the DOM zone and DOM LSE zone? Provide the import limits for the DOM Zone, DOM LSE and rest of PJM modeled in each scenario. Are these import limits implemented on an hourly basis or annual basis?
- b. Regarding the extreme weather year scenario discussed on page 7, please describe the methodology used to create the scenario in detail and provide all associated input workbooks. These should include all workbooks used to create load profiles and any resource availability assumptions.
- c. Regarding the “no-new-gas” scenario discussed on page 8:
 - i. Confirm that other firm dispatchable resources, such as long duration battery storage and VPPs were not allowed in this scenario within the DOM LSE. Explain why.
 - ii. Explain the purpose of limiting new dispatchable resource build within DOM LSE but not limiting them outside of the DOM LSE.
 - iii. Did Brattle increase the DOM LSE build limits on other resources, such as solar and battery storage in this scenario? Please provide the resource specific build limits for this scenario if so. If not, explain why not.
- d. Please provide Brattle’s resource build limit assumptions for the DOM LSE zone, PJM Zone and DOM Zone for each year of the study for each scenario.
- e. Did Brattle use the same assumptions for new resources in each zone? Explain if and why there were any differences between resource parameters in the different zones. Please provide all new resource parameter assumptions, including capital costs, VOM, FOM, heat rates and capacity factors. If these assumptions differ by zone, provide the assumptions for each zone. Please also indicate if these assumptions are consistent with Dominion’s IRP 2024 modeling assumptions, or if there are any areas of divergence.
- f. Please describe the operating reserve requirements used in the Brattle study.

Response:

- a. GridSIM is a zonal model. In gridSIM, PJM is modeled to represent nine distinct energy zones, namely COMED, WMAAC, SWMAAC, ROS, PECO, DPL, NJ, and DOM (LSE and NONLSE). DUKE is modeled as an external zone. These energy zones are not nested. In addition to the energy zones, gridSIM's PJM representation includes capacity zones: MAAC, SWMAAC, EMAAC, COMED, DOM (separating out LSE and non-LSE service areas), and RTO zones. These capacity zones are modeled by aggregating the nine energy zones to represent broader resource adequacy areas, and one capacity zone is additionally modeled to represent the entire PJM RTO. Capacity zones are modeled as nested zones. For example, SWMAAC and EMAAC are two separate zones nested within the MAAC zone. Similarly, COMED, MAAC and the DOM capacity zones are nested within the regional RTO capacity zone. Like MAAC, COMED, and the DOM capacity zones (for both the DOM LSE and non-LSE service areas) are simultaneously capacity zones on their own, while also part of the broader PJM RTO capacity zone. Capacity constraints associated with both individual capacity zones, (such as the DOM zone), and those of the PJM RTO zone (within which these individual zones nest), need to be fully secured against in the optimization to address zonal and regional hourly resource adequacy with cost-effective resource buildout within each capacity zone and across the RTO footprint. The modeled zonal topology provides for consistency with PJM's capacity zones, while making reasonable trade-offs between locational granularity and geographic diversity.

GridSIM is a zonal model (i.e. a "pipe-and-bubble" model). This means that energy flows within a zone (or "bubble") are perfectly uncongested, while energy flows on transmission interfaces modeled between zones are governed by the size of the assumed flow limit (or "pipe" limit). Energy flow limits to and from the Dominion LSE zone to adjacent zones were developed with input from the Company, informed by the historical maximum energy imported by DOM zone. Energy flow limits on the transmission interfaces between the PJM zones outside of the LSE were based on NREL Regional Energy Deployment System ("ReEDS") data. These energy flow limits on transmission interfaces were further refined by applying interface limits that capture simultaneous transfer limits between zonal energy flows based on PJM Reactive Interface data and the NERC Interregional Transfer Capability Study ("ITCS"). Capacity import limits for PJM zones were based on CETL values from the 2025-2026 RPM Base Residual Auction Planning Parameters.

Both energy and capacity import limits govern zonal imports and exports on an hourly basis. However, the level of energy flow is dynamically optimized by the model. Capacity imports are made available to zones fully up to the modeled CETL-based limits for the zones. For the Dominion LSE zone, an additional annual cumulative energy import limit was modeled, allowing the zone to import up to 20% of its total annual energy demand from neighboring PJM zones. But in any hour (such as during the 3-day extreme weather period), DOM LSE and the Dominion Zone are able to import fully up to the zonal energy import limit (of over 16 GW for DOM Zone and over 9 GW for DOM LSE).

- b. Please refer to the response to Sierra Club Set 02-06(c).
As explained in Company Witness Sheilendranath's testimony beginning on page 7, line 13, the limited weather scenario included 26 three-day periods with weather-consistent load, renewable generation, and applicable outage rates for thermal generators, capturing a range of weather conditions that included both representative seasonal peak and off-peak days,

identified using a k-means clustering approach. To model the full weather scenario, the scenario also includes an additional 3 three-day period reflecting projected load (i.e., for future model years), renewable generation, and thermal outage rates over a selected number of heat wave and cold snap periods observed over the past 25 years.

PJM's 2024 Load Forecast Report provides forecasted hourly load through 2039. This forecasted load data for future years is provided corresponding to each of the weather conditions over 25 historical weather years. The load data used in the gridSIM analysis for all 29 representative periods, including the extreme weather periods, are based on these PJM load profiles from PJM's 2024 Load Forecast Report. Renewable generation resource output data for all periods were sourced from Renewables Ninja and from NREL SAM. Resource outage assumptions were sourced from PJM's System Operations Reports, the PJM Winter Storm Event Analysis and Recommendation Report, as well as publicly available research conducted on the correlation between ambient temperature and thermal outage rates. Hourly data used for this scenario (as well as the limited weather scenario) have been provided as part of Attachment Sierra Club 03-02 (AS).

- c.
 - i. Yes, other firm dispatchable resources, (which may be gas-fired RICE engines providing back up to datacenters, flexible loads, or multi-day battery storage, provided they are able to provide capacity continuously for long durations during challenging resource weather conditions) were not allowed in the no-new-gas scenario. This scenario was designed to assess the reliability value provided by new gas and such other non-duration limited firm dispatchable units identified as necessary to maintain resource adequacy in Dominion LSE. The analysis assessed the value that gas and other non-duration limited dispatchable firm resources provides to resource adequacy when adopting build limits and resource options deemed to be available for development in the LSE service area. The reliability value of gas and other dispatchable resources was assessed using the scale and duration of violations observed during the simulations. Notably, the analysis shows that during heat wave and cold snap events, violation events without new gas and other dispatchable capacity occurs continuously for 15 hours at a time. To the extent that long duration storage or VPPs can help resolve resource adequacy issues, it should be available for such a length of time.
 - ii. As explained above, the scenario was designed to evaluate the resource adequacy value provided by gas and other dispatchable units identified in the full weather scenario as needed for maintaining resource adequacy in the Dominion LSE, given build limits and availability of resource options. This scenario was not performed to evaluate the resource adequacy value that gas and dispatchable resources across PJM provide to PJM or to its other zones.
 - iii. No. As explained above, this scenario was designed to assess the reliability value provided by new gas and other dispatchable units to the LSE, adopting the build limits and resource options deemed to be available for the Company to develop, and not to determine substitutes for these resources.
- d. As explained in the paragraph beginning on line 27 of page 8 of Witness Sheilendranath's testimony, the analysis adopted the build limits (within the LSE) set forth by the Company in its 2024 IRP. The non-LSE region of the Dominion zone maintained the same storage and wind build limits as that of the LSE. Outside of the Dominion zones (LSE and the rest of the DOM zone), considering inter-zonal transmission capabilities for both energy and capacity, the analysis is designed to identify the types and scale of new resources the rest of PJM would need to cost-effectively address the hourly adequacy for the region. Therefore, for the rest of

PJM, no build limits were imposed (with the exception of an assumption that no more than 100 GW of total wind capacity in PJM and 48 GW of offshore wind for Maryland and New Jersey, given estimated land limitations).

- e. Only capital cost assumptions (and renewable profiles) differ between resources within the Dominion zones (LSE and non-LSE) and the rest of PJM zones (capital cost assumptions within rest of PJM zones are the same capital costs for Dominion LSE and non-LSE service areas are the same.) Capital cost assumptions for PJM zones outside of the Dominion zone were largely based on publicly available data from NREL Annual Technology Baseline (“ATB”) 2024 and EIA, adjusting for interconnection costs from LBNL. For the Dominion zones, starting overnight capital costs, adjusted for interconnection, were aligned with overnight installed cost provided by the Company and converted to capital cost inputs for the model using Construction Finance Factors from NREL ATB. The resulting cost estimates used for PJM zones as well as the Dominion zones have already been provided as part of Attachment Sierra Club 03-02 (AS). The FOM adopted across all zones was based on NREL ATB 2024. Assumptions regarding VOM, FOM, heat rates and renewable resource availability (represented as hourly capacity factors) have been provided within Attachment Sierra Club 03-02.
- f. The analysis maintained an operating reserve margin of 4.4% over the projected hourly load for all capacity zones for each modeled year. The modeled operating reserve margin is based on an April 2024 PJM RCSTF committee presentation’s proposed PJM reserve requirements.¹

¹ PJM, “RCSTF PJM Reserve Requirements: Challenges & Proposed Solution”, 2024. <https://www.pjm.com/-/media/DotCom/committees-groups/task-forces/rcstf/2024/20240417/20240417-post-meeting---item-03---pjm-reserve-requirement-challenges-and-proposed-solution.pdf>.

EXHIBIT DG-4

Dominion Response to

Appalachian Voices Request No. 2-4(b)

Virginia Electric and Power Company
Case No. PUR-2025-00037
Appalachian Voices
Second Set

The following response to Question No. 4 of the Second Set of Interrogatories and Requests for Production of Documents propounded by Appalachian received on May 6, 2025, was prepared by or under the supervision of:

Kenneth F. Mayer
Energy Market Strategic Advisor
Dominion Energy Services, Inc.

Question No. 4

Please refer to the forward-cast “cold snap analysis” described at pages 23–26 of Witness Crabtree’s Direct Testimony and provide the following information regarding the underlying modeling assumptions.

- a. Provide the assumptions around PJM and external capacity mixes and resource availability used in the forward-cast cold snap analysis.
- b. Please describe any modeling assumptions and constraints that may affect battery energy storage operation, including but not limited to: initial state of charge, lookahead logic, or other dispatch limitations. Provide any workbooks used to develop these parameters with formulae intact.
- c. Describe whether load, renewables availability, and outage data are weather-correlated for the Company and all modeled neighboring regions. If so, provide the workbooks with formulae intact used to derive these trends and to model them in PLEXOS.

Response:

- a. No assumptions were made regarding PJM or external capacity mixes other than those underlying the commodity forecasts provided by ICF in the 2024 IRP.
- b. Battery storage discharge was patterned after the operational data of the Dry Bridge storage facility, scaled to the total BESS build in 2030. Battery and Pump Storage were charged based on non-discharge hours and smoothed. See Attachment APV Set 02-04 (KFM) for details.
- c.

Generation: See Attachment APV Set 02-04 (KFM) for details.

- Offshore Wind was patterned after CVOW Pilot.
- Solar under development and generic solar were patterned after Colonial Trail.

- Mount Storm 1 and Bath County 5 were offline during the 2025 event. These units were added back in the 2030 chart.
- All units except solar, wind, and BESS were reduced by their class average Weighted Effective Forced Outage Rate (“WEFOR”) published by PJM on January 13, 2025: <https://www.pjm.com/-/media/DotCom/planning/res-adeq/res-reports/2019-2023-pjm-generating-unit-class-average-values.pdf>.
- Older oil CTs that can no longer be serviced were removed. Note: these units ran during the event.

Load: hourly load was scaled to 2030 based on Attachment APV Set 02-04(c) Load Forecast (JB) This is the same workbook provided in the 2024 IRP. See Attachment APV Set 02-04 (KFM) for details.

- Data center load was modeled as a flat block (Delta between 2025 and 2030).
- Non-data-center load was scaled up as an annual % growth (delta between 2025 and 2030 with data center load removed).
- The ‘Customer Load’ tab uses the ‘USE ME - Annual Energy LSE’ and ‘Step1-10 Peak NCP’ tabs from the Load Forecast workbook.

EXHIBIT DG-5
Dominion Response to
Appalachian Voices Request No. 2-2

Virginia Electric and Power Company
Case No. PUR-2025-00037
Appalachian Voices
Second Set

The following response to Question No. 2 of the Second Set of Interrogatories and Requests for Production of Documents propounded by Appalachian received on May 6, 2025, was prepared by or under the supervision of:

Kenneth F. Mayer
Energy Market Strategic Advisor
Dominion Energy Services, Inc.

Question No. 2

Please refer to the forward-cast “cold snap analysis” described at pages 23–26 of Witness Crabtree’s Direct Testimony.

- a. Provide the PLEXOS database in its native *.xml format and all required input *.csv or excel datafiles used to conduct any capacity expansion or production cost modeling.
- b. Provide all workbooks, with formulae intact, results, and necessary datafiles used to evaluate the January 2025 cold snap “forward-cast” to 2030. Include any alternative portfolios assessed to evaluate the cold snap with and without the CERC project.

Response:

- a. No new expansion plan was modeled in PLEXOS specifically for the “Cold Snap” charts. Instead, the generic unit additions were from Figure 5.1.5: VCEA with EPA Build Plan Summary in the 2024 Integrated Resource Plan . All new gas-fired units were removed from this build plan.
- b. See Attachment APV Set 02-04 (KFM). No other alternative portfolios were developed.

EXHIBIT DG-6

Dominion Response to Sierra

Club Request No. 2-3

Virginia Electric and Power Company
Case No. PUR-2025-00037
Sierra Club
Second Set

The following response to subparts (a) and (d)-(f) to Question No. 3 of the Second Set of Interrogatories and Requests for Production of Documents propounded by Sierra Club received on May 9, 2025, was prepared by or under the supervision of:

Akarsh Sheilendranath
Principal
The Brattle Group

The following response to subpart (c) to Question No. 3 of the Second Set of Interrogatories and Requests for Production of Documents propounded by Sierra Club received on May 9, 2025, was prepared by or under the supervision of:

Lisa R. Crabtree
Director, Strategic Planning
Dominion Energy Services Inc.

As it pertains to legal issues, the following response to subpart (b) to Question No. 3 of the Second Set of Interrogatories and Requests for Production of Documents propounded by Sierra Club received on May 9, 2025, was prepared by or under the supervision of:

Timothy D. Patterson
McGuireWoods LLP

Question No. 3

Please refer to the Direct Testimony of Witness Sheilendranath on page 4, which discusses the “Brattle analysis” or “reliability study.”

- a. Provide the full referenced Brattle analysis.
- b. Provide any internal Dominion slide decks, presentations, or reports on the results of the study.
- c. Explain why Dominion didn’t prepare and submit this study or a similar study as part of its 2024 IRP.
- d. Regarding scenarios modeled:
 - i. Indicate whether Brattle evaluated a scenario with a combination of CTs and BESS instead of the full proposed CT capacity.
 - ii. Indicate whether Brattle modeled a scenario with incremental EE investment up to required EE investment levels.

- e. Regarding model outputs:
 - i. Provide the portfolio outputs from all modeled scenarios.
 - ii. Provide the resource portfolio selected by gridSIM that was largely similar to the “VCEA with EPA” plan referenced on page 15 of the Direct Testimony of Witness Crabtree.
 - iii. Provide the installed nameplate capacity results by zone and by resource type in the “no-new-gas sensitivity” referenced on page 6 of the Direct Testimony of Witness Sheilendranath.
- f. Regarding Brattle’s input assumptions:
 - i. Provide the new resource cost assumptions Brattle modeled.
 - ii. Provide the resource ELCCs that Brattle modeled.
 - iii. Provide Brattle’s assumptions for load growth in PJM.
 - iv. Indicate whether Brattle’s input assumptions included any assumptions for load flexibility.
 - 1. If yes, explain how Brattle modeled flexibility.
 - 2. Provide the load shapes that Brattle modeled with and without flexibility.
 - v. Describe Brattle’s assumptions around backup load generation at data centers.
 - vi. How did Brattle select the representative year that the Company selected to model as described in the Direct Testimony of Witness
 - 1. Sheilendranath on page 5, at footnote 1.

Response:

- a. The pre-filed direct testimony of Company Witness Sheilendranath provides the results of the referenced analysis.
- b. The Company objects to this request to the extent it seeks information that may be protected by attorney client privilege, work product doctrine, or other recognized privileges.
- c. The 2024 IRP is not a request for approval of any particular resource or portfolio of resources.
- d. Company Witness Sheilendranath did not model other scenarios other than those explained in the testimony, namely the “limited weather” scenario, the “full weather” scenario, and the “no-new-gas” scenario. Other scenarios, including potential sensitivities with updated higher 2025 PJM load forecasts, were not modeled.
 - i. No. As described on page 8, lines 29-30 of his testimony, Company Witness Sheilendranath adopted the build limits provided by the Company for BESS and CTs, and no additional BESS was assumed to be available.
 - ii. No.
- e.
 - i. Please refer to Attachment Sierra Club 02-03 (AS), which provides portfolio outputs for all modeled scenarios.
 - ii. Please see results in the table entitled “DOM_LSE Capacity” in worksheet “3Ei” in Attachment Sierra Club 02-03 (AS). The Limited Weather scenario results are

largely similar to that of the VCEA and EPA plan [Dominion team – Please confirm]

- iii. Please refer to Attachment Sierra Club 02-03 (AS) (worksheet “3Eii”), which provides portfolio outputs for the “no-new-gas” sensitivity for the DOM LSE zone and buildout across all of PJM.
- f.
 - i. Please see Attachment Sierra Club 02-03 (AS) for new resource cost assumptions in PJM and the DOM zones.
 - ii. Please refer to the section of the Witness Sheilendranath’s testimony beginning page 7, line 13, which explains the hourly resource adequacy construct employed in this modeling. This is a unique (but necessary refinement to resource adequacy) methodology which complements the Company’s modeling work in PLEXOS. This resource adequacy methodology does not rely on exogenous assumptions on capacity accreditation or ELCC ratings for different resource types. As described in footnote 5 of Witness Sheilendranath’s testimony, capacity contribution of resources in the system are endogenously assessed based on the maximum available output (based on their capacity factor, state of charge, etc.) of both thermal and non-thermal generating resources, hour-to-hour rather than based on a pre-determined projection of annual capacity accreditation for resources. This approach ensures a more realistic estimate of resource contribution in each hour, as it appropriately captures the effect of the fleet composition on a resource’s hourly resource adequacy contribution, rather than relying on the use of static ELCC projections. Please refer to Attachment Sierra Club 02-03 (AS), which shows generation availability for each hour of each modeled year.
 - iii. Witness Sheilendranath employed the 2024 PJM load forecast. He relied on input from the Company on their LSE load growth, within the DOM zone.
 - iv. Witness Sheilendranath did not explicitly model load flexibility.
 - 1. As noted in Witness Sheilendranath’s testimony on page 9, he models the availability of “other firm dispatchable” capacity in gridSIM. This other firm dispatchable capacity was added as an option to represent the possible development of other dispatchable resources, such as virtual power plants (“VPPs”), flexible gas-fired RICE engines providing backup to Data Centers that may be able to provide capacity to grid, multi-day storage facilities or any other non-duration limited firm capacity. Moreover, as he notes on page 15 of his testimony, he finds that violation events in the “no-new-gas” scenario may last for as long as 15 consecutive hours during major cold snaps, which seems to indicate the need for other non-duration limited (or long duration) firm capacity capable of handling long duration reliability events.
 - 2. Please see Attachment Sierra Club 02-03 (AS) for load modeled without flexibility. As described, no other load shape was modeled.
 - v. Witness Sheilendranath did not make any specific assumptions regarding backup generation at data centers. In gridSIM modeling, all hourly demand (at the wholesale grid level) needs to be balanced with grid-scale resources, including other dispatchable capacity, which may represent (non-duration limited) dispatchable capacity options, including potential contributions from VPPs and

data center back-up facilities to the extent they can provide firm capacity for the durations required.

- vi. The model years chosen for modeling were informed using input from the Company. The analysis considered the tradeoff between increasing modeling complexity with modeling additional years and capturing sufficient complexity necessary for conducting the granular hourly resource adequacy analysis.

EXHIBIT DG-7
CASE No. PUR-2025-00184,
Dominion Response to
Staff Request No. 7-154(k)

Virginia Electric and Power Company
Case No. PUR-2024-00184
Virginia State Corporation Commission Staff
Seventh Set

The following response to Question No. 154(a) through (j) and (l) of the Seventh Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on January 2, 2025, was prepared by or under the supervision of:

Jarad L. Morton
Manager, Integrated Strategic Planning
Dominion Energy Services, Inc.

The following response to Question No. 154(e) and (k) of the Seventh Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on January 2, 2025, was prepared by or under the supervision of:

Michael S. Oberleitner
Fuel Commodity Specialist
Dominion Energy Virginia

As it pertains to legal matters, the following response to Question No. 154 of the Seventh Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on January 2, 2025, was prepared by or under the supervision of:

Nicole M. Allaband
McGuireWoods LLP

Question No. 154

Please refer to the Company's response to Staff Interrogatory No. 3-86.

- (a) When modeling the conversion of the three coal units to burn natural gas, was each unit still available for the model to select for dispatch during the period during which the conversion would take place?
- (b) Please provide a narrative discussion of how the Company accounts for the downtime associated with making these conversions, what assumptions the Company makes about these unit's ability to run continuously throughout the conversion process, and how to account for other energy or capacity resources that would be needed to cover any lost energy and capacity of these three units while they underwent conversion.
- (c) Please provide a narrative discussion of how, in the modeling, the Company accounted

for each unit's characteristics during the time from when the unit started its conversion until completion. Please include in that discussion any modifications to the capacity and energy production characteristics, or changes in availability, that may have been modified to account for interruptions related to the work necessary to convert the units to burn natural gas.

- (d) Do the total costs of converting the units include the cost of providing for an alternative fuel source? If so, what secondary fuel source was assumed? If not, why?
- (e) Do the total costs of converting the units include the costs of the new greenfield pipeline laterals?
- (f) Do the total costs of converting the units include any lost energy or capacity resulting from the units not being available while the units are being converted to burn natural gas?
- (g) Please provide a narrative explanation why the generation from coal is higher on average over the period of 2027 through 2029 in the VCEA with EPA Portfolio as compared to the VCEA without EPA Portfolio.
- (h) Once the units are converted to burn natural gas, will these units be considered new natural gas units for the purpose of the new EPA rules? Please provide a narrative discussion of the Company's understanding or reasoning as to why or why not.
- (i) Does the Company anticipate, and does the Company's modeling reflect, all three units undergoing the necessary conversions simultaneously and the simultaneous construction of the greenfield pipeline laterals?
- (j) Please provide a narrative discussion of what the consequences would be if the conversion took longer than 3 years.
- (k) Please refer to sub-part (h) of the Company's response. What does the Company mean when it says, "fully subscribed"?
- (l) Please refer to sub-part (i) of the Company's response. What's the timeline from (i) Dominion determining that it must convert the units, to (ii) the units being fully converted to burn natural gas, to (iii) the greenfield pipelines being in place to deliver fuel? At what point in this process would the Company expect to have the secondary fuel source in place for each of the units?

Response:

The Company objects to this request as not relevant or reasonably calculated to lead to the production of admissible evidence in this proceeding as the Company is not seeking approval of any particular resource in this proceeding. The Company also objects to this request because it calls for a speculative response that would depend on many case-specific factors at the time of filing a request for approval of a resource. Notwithstanding and subject to these objections, the

Company provides the following response.

- (a) Yes. As explained in Section 5.1 of the 2024 IRP, the Company needed to make certain compliance assumptions related to the new environmental regulations described in that section, for the 2024 IRP modeling. The Company chose to model compliance with Section 111(d) by converting the Company's three remaining coal stations to burn natural gas by January 1, 2030, using costs published by the EPA. Given that the final rule under Section 111(d) was not published until May 9, 2024, and the 2024 IRP was due to be filed on October 15, 2024, the Company has not had time to fully evaluate how each station might comply with Section 111(d) along with other recently finalized environmental regulations. Without time to conduct further analysis, the modeling assumptions used for converting the existing coal stations to natural gas were high-level and limited to those costs published by EPA. It is important to note that the Company has not finally decided how it will choose to comply with Section 111(d) and is not obligated to do so until May of 2026. It is also important to note that the Company is not seeking Commission approval for the gas conversion of its remaining coal stations in this filing. The Company is continuing to evaluate options for compliance, as well as the costs and timeline of those options, and will continue to refine its assumptions in future IRP filings.
- (b) See the Company's response to subpart (a)
- (c) See the Company's response to subpart (a)
- (d) See the Company's responses to subpart (a) and Staff Set 03-86(f).
- (e) No. See the Company's responses to subpart (a), as well as Staff Set 03-86(g) and United Set 02-22(d).
- (f) No. See the Company's response to subpart (a)
- (g) The capacity factors of coal units in the VCEA with EPA and VCEA without EPA Portfolios are slightly different due to the energy and commodity forecast differences between the two ICF forecasts. This difference is small and averages to less than 0.3% from 2027-2029.
- (h) The Company objects to this request because it calls for a legal conclusion. Notwithstanding and subject to this objection, the Company provides the following response.

No. If a unit converts from coal to natural gas, the unit can operate as a "natural gas steam generating unit" under EPA's Section 111(d) rule. Natural gas steam generating units under the Section 111(d) rules do not have to retire, those units must meet applicable emission limitations based on the unit's capacity factor upon startup. All coal operations would need to cease by January 1, 2030.

- (i) The Company's analysis did not include the timing of the conversions. The analysis and modeling incorporated the costs of conversion. See the Company's response to subpart (a).
- (j) See the Company's response to subpart (a). The Company cannot speculate at this time as to what, if any, consequences there would be, or whether there would be exceptions to the rule, if possible gas conversions were to take longer than 3 years.
- (k) The term "fully subscribed," as it pertains to natural gas pipelines, means there is no available, unsubscribed, firm transportation on the pipeline.
- (l) See the Company's response to subpart (a).

EXHIBIT DG-8

Dominion Response to

Sierra Club Request No. 4-2

Virginia Electric and Power Company
Case No. PUR-2025-00037
Sierra Club
Fourth Set

The following response to Question No. 2 of the Fourth Set of Interrogatories and Requests for Production of Documents propounded by Sierra Club received on May 23, 2025, was prepared by or under the supervision of:

Michael S. Oberleitner
Fuel Commodity Specialist
Dominion Energy Virginia

Question No. 2

Does the Company anticipate having a firm gas contract for the CERC project by 2030?

Response:

Yes.

CERTIFICATE OF SERVICE

I certify that on July 25, 2025, I sent the foregoing by electronic mail to:

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