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Appalachian Mountain Advocates

West Virginia
Post Office Box 507
Lewisburg, WV 24901
(304) 645-9006

Virginia
415 Seventh Street NE
Charlottesville, VA 22902
(434) 529-6787

www.appalmad.org

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BY ELECTRONIC FILING

Mr. Bernard Logan, Clerk
c/o Document Control Center
STATE CORPORATION COMMISSION
Tyler Building — First Floor
1300 East Main Street
Richmond, Virginia 23219

RE: Commonwealth ex rel. State Corporation Commission, In re: Virginia Electric and Power Company's Integrated Resource Plan filing pursuant to Virginia Code § 56-597

Case No. PUR-2023-00066

Dear Mr. Logan,

Please find attached for filing in the above-captioned case the **Public Version** of the Direct Testimony of Devi Glick on behalf of the Sierra Club. The Club is also filing under separate cover a Confidential / Extraordinarily Sensitive Supplement to this Testimony, which will consist of four unredacted pages of Ms. Glick's testimony.

Please do not hesitate to contact me if you have any questions regarding this filing.

Thank you,

Evan Dimond Johns
APPALACHIAN MOUNTAIN ADVOCATES
Post Office Box 507
Lewisburg, West Virginia 24901
Phone: (434) 738 - 1863
E-Mail: ejohns@appalmad.org

Copied by Electronic Mail:
Commission Staff
Service List

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

COMMONWEALTH OF VIRGINIA, *ex rel.*

STATE CORPORATION COMMISSION   Case No. PUR-2023-00066

In re: Virginia Electric and Power Company's 2023 Integrated Resource Plan filing pursuant to Virginia Code § 56-597 *et seq.*

DIRECT TESTIMONY of

DEVI GLICK

on behalf of the

SIERRA CLUB

August 8, 2023

(PUBLIC VERSION)

Summary of the Direct Testimony of Devi Glick

Dominion's 2023 Integrated Resource Plan presents the first look at the Company's plan to address the dramatic data center load growth that it expects to see over the next few decades. This data center load growth is the main driver of the results Dominion presents in this IRP – mainly the need for substantial new capacity and for the Company to keep its existing coal and gas resources online.

Dominion's Plan B (the closest the Company has to a "Preferred Plan") includes a sizable quantity of new clean energy resources, new gas combustion turbines (CT), and small modular reactors (SMR). In this Plan, Dominion also extends the life of its aging fossil units at the Virginia City Hybrid Energy Center (VCHEC), Clover and Mt. Storm - some of which previously had near-term retirement dates- beyond 2045. Because of its continued reliance on fossil resources, Plan B falls far short of both the VCEA requirement to retire all carbon-emitting resources by 2045 and the RPS requirement for renewable generation. Ratepayers will then be on the hook for large RPS penalties incurred from Dominion failing to meet its RPS, and large ongoing investments in capital and maintenance required to keep its aging fossil units online. Ratepayers could also be on the hook for large stranded-asset costs at the new fossil plants that Dominion is planning to build in Plan B if the plants are still carbon-emitting by 2045.

My independent modeling examines three scenarios: (1) Dominion Plan B, which fixes the resources from Dominion's Plan B; (2) Synapse Optimized, which optimizes resource additions and retirement dates and relaxes the build limit on solar PV and battery storage; and (3) Synapse 111 (d)-Compliant, which also uses the relaxed build limits and retires VCHEC, Clover, and Mt. Storm by 2035 to achieve compliance with the Environmental Protection Agency's proposed Clean Air Act Section 111(d) rules. I find that Dominion's decision to push back the retirement dates of its existing coal plants to meet data center load growth is not in the best interest of ratepayers. If Dominion retires the three plants, and builds incremental solar PV and battery storage, it will reduce CO_2 emissions and save ratepayers between \$4.1 (based on Dominion renewable costs) and \$9.0 billion (based on the National Renewable Energy Lab Annual Technology Baseline costs) over the 25-year study period.

I recommend that the Commission require Dominion to revise its 2023 IRP by (1) lifting or easing the build limits it has placed on solar PV and battery storage, and justifying the limit it chooses; (2) modeling the impact of the proposed 111(b) and (d) rule on its existing and proposed new fossil resources; and (3) testing a lower cost sensitivity for solar PV and battery storage resources to reflect the market trend in falling renewable energy costs. Dominion should then re-run its model with these updated assumptions and allow the model to choose from among the clean energy resources available.

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1. INTRODUCTION AND PURPOSE OF TESTIMONY

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

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

Q **Please describe Synapse Energy Economics.**

A Synapse is a research and consulting firm specializing in energy and environmental issues, including electric generation, transmission and distribution system reliability, ratemaking and rate design, electric industry restructuring and market power, electricity market prices, stranded costs, efficiency, renewable energy, environmental quality, and nuclear power.

Synapse's clients include state consumer advocates, public utilities commission staff, attorneys general, environmental organizations, federal government agencies, and utilities.

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

A At Synapse, I conduct economic analysis and write testimony and publications that focus on a variety of issues related to electric utilities. These issues include power plant economics, electric system dispatch, integrated resource planning, environmental compliance technologies and strategies, and valuation of distributed energy resources. I have submitted expert testimony before state utility regulators in more than a dozen states.

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

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

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

A I am testifying on behalf of Sierra Club.

Q **Have you testified previously before the State Corporation Commission of Virginia?**

A Yes, I submitted testimony in Case No. PUR-2023-00005, Case No. PUR-2022-00006, and Case No. PUR-2018-00195—all cases in which Virginia Electric and Power Company (Dominion or the Company) requested recovery of costs associated with environmental controls and compliance. I also submitted testimony in Case No. PUR-2022-00051, Appalachian Power Company's Integrated Resource Planning (IRP) docket.

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

A In this proceeding, I review Dominion's 2023 Integrated Resource Plan (2023 IRP) and evaluate its final portfolios, modeling methodology, and input assumptions. I then present the results of Synapse's alternative clean energy analysis. Synapse's 111(d)-Compliant Clean Energy scenario meets the Company's high load forecast and complies with the Virginia Clean Economy Act (VCEA) while retiring the Clover, Mt. Storm, and Virginia City Hybrid Energy Center (VCHEC) power plants earlier, building substantially less new gas capacity, emitting less carbon dioxide (CO_2), and resulting in a lower cost to ratepayers than Dominion's preferred resource plan.

Q **How is your testimony structured?**

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

In Section 3, I review Dominion's resource plan. I summarize the major themes in this IRP, specifically data center load growth and VCEA compliance. I describe Dominion's resource portfolios, its findings on resource additions and retirements, and its modeling methodology. I discuss how the Company's projection of data center load growth is driving the need for substantial new capacity and is driving the need to keep existing coal and gas resources online.

In Section 4, I present the results of Synapse's alternative analysis. I describe our modeling tool and its capabilities. I describe the scenarios and sensitivities we modeled, and outline our input assumptions with a focus on where our assumptions aligned with Dominion's and where they differed. I present the results of Synapse's modeling and show how our results compare to the results the Company presented. I explain the drivers of the differences between Synapse's modeling results and Dominion's.

In Section 5, I provide more context and detail on the sticky issues facing Dominion in this IRP: these include data center load growth, compliance with Virginia's renewable portfolio standards (RPS), and solar siting, as well as the U.S. Environmental Protection Agency's (EPA) proposed Greenhouse Gas Standards and Guidelines for Fossil-Fuel-Fired Power Plants issued under Section 111 of the Clean Air Act (Section 111 Rules). I will discuss the implications of the proposed Section 111 Rules, as well as other proposed environmental regulations, on the future of gas and coal development in the United States.

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

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

2. FINDINGS AND RECOMMENDATIONS

Q **Please summarize your findings.**

A My primary findings are:

1. Dominion's projections around data center load growth are driving Dominion to maintain its existing coal and gas plants throughout the entire 15-year planning period and build a substantial quantity of new generation resources on its system in all its alternative portfolios.

2. Dominion's RPS requirements under the VCEA grow as its load grows. To meet this requirement, in all its alternative portfolios, Dominion must build a substantial quantity of new renewables, or else pay a large RPS compliance penalty.

3. In Dominion's Portfolio B, the Company continues to operate its coal plants at Clover, Mt. Storm, and VCHEC, as well as the majority of its existing gas plants throughout the planning period; the Company falls far short of meeting the RPS; and it does not meet the requirement to retire all carbon-emitting resources by 2045 under the VCEA.

4. Synapse's independent modeling analysis shows that, with the inclusion of the newly proposed section 111 requirements, retiring Clover, VCHEC, and Mt. Storm earlier than Dominion plans in its Plan B will result in lower CO_2 emissions; this earlier retirement will reduce costs for Dominion's ratepayers by between $4.1 and $9.0 billion over the 25-year study period.

5. Dominion put strict build limits on the quantity of solar PV and battery storage that the model could build in each year and did not justify this constraint with any data or analysis to support such a restriction. As a result of these limitations, the model maxed out the amount of solar PV

that it was allowed to add starting in 2031, and the amount of battery storage it was allowed to add starting in 2036.

6. Dominion erroneously calculated its RPS requirements and understated the RPS penalties associated with falling short of its RPS requirements in each portfolio by around $1 billion.

7. With the implementation of regulations under Section 111 of the federal Clean Air Act (Section 111 Rules), the cost to build and operate new gas plants and maintain existing coal plants will be substantially higher than Dominion projected and modeled in its IRP.

Based on those findings, I offer the following recommendations:

1. Dominion should revise its IRP by (1) relaxing the annual build limits on solar PV and battery storage that it imposed on the model, and by adding long-duration battery storage as a resource option; (2) including sensitivities that test lower capital costs for new solar PV and battery storage resources; (3) testing early retirement dates for its coal plants at VCHEC, Clover, and Mt. Storm.

2. Dominion should correct its RPS requirement calculations and update its RPS penalty costs associated with each portfolio.

3. Dominion should begin issuing All-Source RFP's and focus its near-term resource planning efforts on obtaining as much new renewable capacity and energy as soon as possible.

4. Due to the massive impact this proposed rule will have on ratepayers, Dominion should revise its IRP to reflect the proposed 111(b) and (d) requirements by modeling capacity factor limits, the cost to co-fire on natural gas, the cost to co-fire on hydrogen, and the cost to install carbon capture and storage (CCS) on existing and proposed new fossil resources.

3. DOMINION'S PREFERRED RESOURCE PORTFOLIO

Q How is Dominion's 2023 IRP different than the last full IRP it filed in 2020?

A Dominion's prior full IRP, the 2020 IRP, was the Company's first resource plan that modeled compliance with the VCEA. The VCEA mandates that Dominion produce 100 percent of its energy from carbon-free sources by 2045. It also sets development targets for solar PV, wind, battery storage, and energy efficiency, and requires the retirement of all carbon-emitting resources, with exceptions only for threats to grid reliability.

In the time since the Company filed its 2020 IRP, there have been several significant changes in the market and the regulatory field. Specifically, the Biden Administration enacted the Inflation Reduction Act, which provides tax incentives for renewables and battery storage, data center load has exploded in the region and is driving Dominion's projections of significant future load growth, and the Biden administration proposed the Greenhouse Gas Standards and Guidelines for Fossil-Fuel-Fired Power Plants, which aim to limit CO_2 and other greenhouse gas emissions under Section 111 of the federal Clean Air Act. Dominion modeled the IRA and high load growth in this IRP; however, the Section 111 Rules were only recently proposed and thus were not modeled in the IRP.

Q **Which of Dominion's portfolios do you focus on for your analysis?**

A Dominion presents five resource plans labeled A through E. My testimony addresses only Plan B and Plan D, as those are the only two that comply with the renewable build limits in the VCEA. We use Plan B as the baseline for comparison with the Synapse alternative portfolio. The main difference between Plan B and D over the next 15 years is that Plan D retires all carbon-emitting resources by 2045, in compliance with the VCEA mandate to retire all carbon-emitting resources by 2045, while Plan B does not. Plan B also relies on a large quantity of new natural gas to meet growing load while Plan D relies on more small modular nuclear reactors (SMR) and a larger increase in capacity import limits.[1]

Q **Please summarize the resource retirements Dominion modeled over the next 15 and 25 years in Plan B.**

A Dominion modeled no coal or gas plant retirement for the next 15 and 25 years in Plan B beyond the 1,804 MW of capacity at Yorktown 3 and Chesterfield 5 and 6, which will retire in 2023. As shown in Table 1 below, this deviates from the Company's modeling in its 2020 IRP where it modeled the retirement of over 3,000 MW of capacity. This included 439 MW of coal capacity at Clover in 2025;

1 Dominion 2023 IRP at 26, 28.

165 MW of gas capacity at Rosemary in 2027; and 153 MW of biomass capacity at the Altavista, Hopewell, and Southampton sites in 2028.

Table 1. Unit Retirements from Dominion's 2020 IRP Alternative Plan B and 2023 IRP

Year	Unit in 2020 IRP (MW)	Unit 2023 IRP (MW)
2023	Yorktown 3 (790 MW) Chesterfield 5 and 6 (1,014 MW)	Yorktown 3 (790 MW) Chesterfield 5 and 6 (1,014 MW)
2024		
2025	Clover 1 and 2 (439 MW)*	
2026		
2027	Rosemary (165 MW)	
2028	Altavista (51 MW) Hopewell (51 MW) Southampton (51 MW)	
2029 - 2038		
Total	**3,184 MW (2035 Total)**	**1,804 MW**

**Note:* *Dominion planned to retire Clover in 2025 in both its 2021 and 2022 IRP updates. The 2023 IRP is the first time the Company has presented a later retirement date for the Plant.*

Q When does Dominion plan to retire its existing fossil units?

A As stated above, in Plan B, Dominion doesn't retire any other fossil units during the 15- or 25-year study periods in Plan B—though it does retire some of the units in the 25-year window in Plan D.[2] Instead, Dominion states that it plans to keep its gas and coal plants online to provide energy and capacity to meet its growing data

2 *Id.*

center load and maintain reliability while expanding renewable generation[3] (the Company plans to keep the three biomass units online so it can use the renewable energy credits for RPS compliance).[4] This is concerning as (1) the Company's own 10-year net present value (NPV) analysis shows that Rosemary and VCHEC—plants Dominion plans to keep operating for the next two decades—have negative ten-year cash flows;[5] and (2) the VCEA requires the retirement of all carbon-emitting resources by 2045 (with an exception for reliability reasons).[6]

Q What resources did Dominion add to its system in Plan B?

A In Plan B, Dominion added resources to meet the VCEA target of 16,100 MW of solar and/or onshore wind resources and 2700 MW of storage resources by 2038.[7] Dominion also included in Plan B two tranches of offshore wind, the first of which is under construction and scheduled to come online in 2027; 2910 MW of new gas combustion turbines (CT); and 804 MW of new SMRs. Table 2 below shows the annual resource additions by resource type through 2038.

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3 *Id.* at 23-24.

4 *Id.* at 82.

5 *Id.* at 83.

6 *Id.* at 81.

7 Company's Response to Commission Staff Discovery Request No. 9-194, attached as Exhibit DG-2.

Table 2. Capacity Additions in Dominion Plan B (MW)

Year	Solar PPA	Utility PV	Solar DER	Wind	Storage	Gas CT	SMR (Nuclear)	Capacity Purchase
2024								1,100
2025								1,100
2026								1,600
2027	210	390	15	2,600				700
2028	231	429	30	260	90	970		200
2029	231	429	45		120			600
2030	252	468	45		150			900
2031	315	585	111	60	180			1,300
2032	315	585	111		180			1,800
2033	315	585	111	2,600	240			1,600
2034	315	585	111	60	240		268	1,900
2035	315	585	114		270	485		2,100
2036	315	585	114		300	485	268	2,100
2037	315	585	114	60	300	485		2,300
2038	315	585	114		300	485	268	2,600
Total	**3,444**	**6,396**	**1,035**	**5,640**	**2,370**	**2,910**	**804**	**21,900**

Source: Dominion 2023 IRP at 26.

Notes: 2600 MW of offshore wind is currently under construction and is scheduled to come online in 2027. The second tranche of offshore wind was programmed into the model in 2033. Also, the solar capacity does not include CE-1, CE-2, and CE-3 resources.

Q How did Dominion create the portfolio of resources it presents in Plan B?

A Dominion used PLEXOS, a model designed for capacity optimization and dispatch. In Plan B, Dominion programmed into PLEXOS VCEA development targets through 2038,[8] one set of CTs at Chesterfield[9] that it plans to bring online

8 Dominion did not provide clarity on the exact resources it modeled for VCEA compliance. *See*, *e.g.*, Exhibit DG-2; Company's Response to Appalachian Voices Discovery Request No. 3-6, attached as Exhibit DG-3; Company's Response to Clean Virginia Discovery Request No. 3-28, attached as Exhibit DG-4.

9 Company's Response to Commission Staff Discovery Request No. 1-23, attached as Exhibit DG-10.

in 2027, and a second tranche of offshore wind in 2033. The remaining resources, specifically the CTs beyond 2035 and the SMRs, were selected endogenously by the model based on a least-cost optimization.[10] Dominion also allowed the model to increase capacity imports during the study period. In Plan B, Dominion purchased over 4 GW of capacity in 2041 and beyond, and in Plan D, Dominion purchased over 10.8 GW of capacity and 14 GW of energy in 2045 and beyond.[11]

Dominion allowed the PLEXOS model to optimize retirement dates for its existing fossil resources.[12] This is an improvement in the Company's modeling approach from its 2020 IRP where Dominion did not allow the model to optimize resource decisions and instead programmed in all resource retirements and additions without consideration for whether earlier retirements of other resource additions would be more economic.[13]

10 *See* Exhibits DG-2, DG-3.

11 Dominion 2023 IRP at 23–24.

12 *See* Company's Response to Sierra Club Discovery Request No. 2-12(a), attached as Exhibit DG-5.

13 Sierra Club Witness Rachel Wilson advocated for the Company to optimize the capacity expansion functions of PLEXOS during the 2020 IRP process. *See Commonwealth ex rel. State Corporation Commission in re: Virginia Electric & Power Company's Integrated Resource Plan Filing*, Case No. PUR-2020-00035, Direct Testimony of Rachel Wilson on Behalf of Sierra Club (September 14, 2020), available at https://tinyurl.com/y9t3784x.

Q Should Dominion adopt an optimized portfolio as its preferred plan?

A Not necessarily. The use of optimized capacity expansion modeling is critical to the IRP process, but does not ensure the best outcome for ratepayers. A model is not a replacement for thinking critically and asking the right questions. An optimized model run will produce the lowest cost portfolio under a specific set of circumstances. But an optimization will not automatically show you all the other alternative portfolios that maintain reliability without materially increasing costs to ratepayers, or under slightly different assumptions. To see that solution set, Dominion must ask the model to test specific alternative portfolios.

In an environment with this level of uncertainty around load and future regulations, I would never recommend that Dominion blindly adopt the optimized portfolio without critically evaluating and understanding the level of uncertainty and risk inherent in its assumptions and testing alternative scenarios.

Based on Dominion's current inputs and load growth assumptions, in Plan B the model showed that keeping Clover and Mt. Storm online beyond 2045 was part of Dominion's optimized portfolio. But if Dominion tested an earlier retirement scenario, as Synapse did in our portfolio, it should find that early retirement is actually very close in cost to the Company's optimized portfolio. And with slightly different assumptions, such as the relaxation of the build limit, an alternative portfolio may be lower in cost than the original optimized portfolio.

Q What constraints did Dominion place on the model in creating Portfolio B?

A Dominion placed an annual build limit on most resources, including 300 MW/year for battery storage,[14] and 900 MW/year for solar PV.[15] This build limit constrained the resources added in later years, as the model maxed out solar additions in every year after 2030 and storage in every year after 2035.[16]

4. SYNAPSE'S CLEAN ENERGY SCENARIOS

Q Please describe the modeling exercise that Synapse completed relating to Dominion's 2023 IRP.

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

- Short-term scheduling, including detailed unit commitment and economic dispatch, with modeling of load shaping and shifting capabilities;
- Mid-term energy budgeting analysis, including maintenance scheduling and risk analysis;
- Long-term integrated planning, including capital project optimization, economic generating unit requirements, and environmental compliance; and

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14 Dominion 2023 IRP at 73.

15 *Id.* at 66.

16 *Id.* at 26.

- Market price forecasting for energy, ancillary services, capacity, and environmental programs.

Q Is the EnCompass model used throughout the power sector?

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

Q Describe the scenarios that Synapse modeled.

A Synapse modeled three scenarios: one as a baseline, one as an alternative clean energy optimized scenario that is not compliant with the proposed Section 111 Rules, and one clean energy scenario that is compliant with those Rules.

- **Dominion Preferred** fixes all of Dominion's Plan B resource additions and retirements in the year modeled by the Company. Synapse ran this scenario to compare the resulting revenue requirement of the Company's preferred resource portfolio to Synapse's clean energy portfolios.
- **Synapse Optimized** increases the build limits for solar PV and battery storage, offers a third tranche of offshore wind to the model, tests an earlier retirement date for Clover to align with 111(d) compliance, and then re-optimizes the retirement dates for VCHEC. We also allowed the model to select long-duration battery storage, and modeled Mercury Air Toxins compliance costs at Mt. Storm. The EnCompass model optimizes the

remaining resources additions and retirements, subject to the VCEA. We also tested a sensitivity with lower capital costs for clean energy resources.

- **Synapse 111(d)-Compliant Clean Energy** is identical to the Synapse Optimized scenario except it hard-codes the retirement of both Clover and Mt. Storm in the 2030s so as to comply with proposed Section 111 Rules.

Q **How do Synapse's input assumptions and model parameters compare to the ones Dominion used?**

A To ensure our results were comparable to Dominion's, we maintained as many of Dominion's assumptions as possible in our scenarios.[17] Specifically, we used Dominion's assumptions for peak and annual energy, load shape, reserve margin, the first two offshore wind unit project additions, distributed solar additions, commodity prices (fuel, CO_2, and hourly energy market prices), resource capacity values, resource maximum capacity factors, resource capital costs, and sustaining capital costs at Dominion's thermal units.[18] We did not increase the import limits during the study period as Dominion did; instead we tested high renewable build limits. Table 3 shows the sources we relied on for our modeling.

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17 With the time constraints in this docket, Synapse did not have an opportunity to independently evaluate each of the assumptions it incorporated from Dominion's modeling; we opted instead 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.

18 For solar PV and offshore wind, we inadvertently used resource shapes from the Horizons Energy National Database for the PJM Dominion region instead of Dominion's internal resource shapes. This should have little effect on the modeling results, however, because the resource shapes used were still for the region.

Table 3. Synapse EnCompass Modeling Input Sources

Item	Source
Load Forecast	Attachment Staff Set 01-41 (KS) Attachment Sierra Club Set 02-04 (JLM)
Reserve Margin	Appendix 4I: Required Reserve Margin (Plan B)
Coal Prices	Attachment Sierra Club Set 05-01(b) (WWJ)
Gas Prices	Attachment Sierra Club Set 04-01 (WWJ)
RGGI Prices	Attachment APV Set 06-04(d-s) (WWJ)
Market Energy Prices	Attachment Sierra Club Set 05-04 (WWJ)
Onshore Wind Costs	Attachment CV Set 01-10(f) (CJR) (ES)
Offshore Wind Costs	Attachment CV Set 01-10(f) (CJR) (ES)
Solar Costs	Attachment CV Set 01-10(f) (CJR) (ES)
Battery Costs	Attachment CV Set 01-10(f) (CJR) (ES)
50-Hour Battery Costs	McKinsey & Company / Long Duration Energy Storage Council, *Net-Zero Power: Long Duration Energy Storage for a Renewable Grid* (November 2021), available at https://tinyurl.com/mrny7rz4.
New Gas CT Cost	Attachment CV Set 01-10(f) (CJR) (ES)
SMR Cost	Attachment CV Set 01-10(f) (CJR) (ES)
Heat Rates	Attachment APV Set 06-04(a-c)(t-y) (JLM) ES-CONF
Firm Capacity Ratings	Attachment CV 01-03(f) (JLM) CONF
Existing Resource FOM & VOM Costs	Attachment CV Set 01-03(f) (JLM) CONF
Resource Build Limits	Attachment CV 01-10(f)(CJR) ES CORRECTED
RPS Requirement	Attachment Staff Set 01-44 (JLM)
Starting RPS Bank	Response to Staff Set 03-100
ELCC Values	Attachment Staff Set 01-34 (JLM)
Renewable Capacity Factors	Attachment APV Set 06-04(a-c)(t-y) (JLM) (ES)
Financial Parameters (WACC)	Attachment Sierra Club 02-11 (JLM) (ES)
Interconnection / Integration Costs	Dominion 2023 IRP at 61

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.

Q **Which of Dominion's inputs or assumptions are you most concerned about?**

A I am concerned that Dominion is unnecessarily restricting renewable deployment in the region and over-stating renewable costs. Dominion provided no tangible analysis to justify its renewable build limits,[19] therefore I relaxed the constraint in my alternative portfolios. For renewable costs, I relied on Dominion's assumptions in my two scenarios to ensure a valid comparison between the base and alternative portfolios. I then added a sensitivity that used the National Renewable Energy Laboratory (NREL) Annual Technology Baseline (ATB) 2023 lower costs assumptions for all scenarios. I am also concerned that Dominion did not include long-duration battery storage in its modeling.

Q **Why did you conduct a sensitivity with lower solar and storage capital costs?**

A When I compared Dominion's cost projections to the 2023 ATB report, I found that Dominion's costs for solar PV and battery storage were substantially higher than industry projections. Extraordinarily Sensitive Figure 1 below shows the comparison of the costs Dominion modeled (the costs we included in our base scenarios) and the NREL ATB costs that we modeled in a sensitivity. I modeled this sensitivity because I believe Dominion's cost projections are too high in light of trends in falling renewable costs, and with movement on interconnection reform.

19 Company's Response to Commission Staff Discovery Request No. 1-65, attached as Exhibit DG-6.

Extraordinarily Sensitive Figure 1. Comparison of Dominion and NREL ATB Solar and Storage Capital Costs

[BEGIN EXTRAORDINARILY SENSITIVE]

[redacted]

[END EXTRAORDINARILY SENSITIVE]

Sources: NREL ATB 2023; Dominion Response to CV 1-10(f), Attachment CV Set 01-10(f) (CJR) (ES). This document contains voluminous spreadsheet data in numerous tabs and can be produced upon request.

Q Does Dominion incorporate the recently proposed Section 111(d) and (b) Rules in its modeling?

A No. The proposed Section 111 Rules came out after Dominion filed its IRP. Regardless of timing, those rules will have a significant impact in limiting future emissions from new and existing fossil plants and require costly capital expenditures. Therefore, I considered them in designing the Synapse alternative scenarios.

Q **How does the retirement timeline in the Synapse Optimized scenario compare to the timeline in Dominion's Plan B?**

A In Plan B, Dominion's model did not retire VCHEC during the study period. In the Synapse Optimized scenario, the model chose to endogenously retire VCHEC as soon as it was allowed to in 2027. In Dominion's Plan B, no other gas or coal plants, including Clover and Mt. Storm, endogenously retired within the study period. In the Synapse Optimized scenario, the model also did not choose to endogenously retire the Clover or Mt. Storm coal plants prior to 2040. Table 4 below shows the coal plant retirement dates for each scenario.

Table 4. Coal Plant Retirement Dates by Scenario (End of Year)

Unit	Dominion Plan B	Synapse Optimized	Synapse 111(d)-Compliant
Clover Units 1-2	None		2031
VCHEC	None	2026	2026
Mt. Storm Unit 1	None		2032
Mt. Storm Unit 2	None		2033
Mt. Storm Unit 3	None		2034

Q **Why doesn't the model choose to retire Clover in 2025 in either Plan B or Synapse's Optimized scenarios?**

A With the large data center load growth that Dominion projects, combined with Dominion's renewable and battery storage build limits, Dominion needs much more energy and capacity than it did when it modeled its 2020 IRP. Without factoring in the proposed Section 111 Rules, the Company keeps its coal plants online longer and uses them to provide additional energy and capacity to meet this data center load. But these results are not all that useful, because with the proposed Section 111 Rules, Dominion cannot run its coal plants through 2045 without changing its operations or making major investments for natural gas co-firing or CCS conversion. Both of these plants have retirement dates past 2040 in Plan B, therefore they would both be required to install CCS by 2030 to operate through their planned retirement dates.

Q Did you test a scenario with earlier retirement dates for Clover and Mt. Storm?

A Yes, in the Synapse 111(d)-Compliant Clean Energy scenario, I assumed Clover would retire by 2032 to avoid any investments or changes related to Section 111 and that Mt. Storm would reduce its capacity factor and retire with a staggered schedule by 2035 to avoid CCS investments.[20] The revenue requirement results of these early retirement scenarios were very similar to the revenue requirement for the optimized scenarios.

20 We assumed Mt. Storm would not choose the co-fire on gas compliance pathway to stay online through 2040 due to the need to build out additional new gas infrastructure for that option.

Q Did Dominion present other analyses on the economics of existing fossil units?

A Yes. The Company conducted a 10- and 25-year cash flow analysis for each of its existing units.[21] In Plan B, VCHEC had a negative cash flow ranging from -$119 to -$305 million over the next 10 years under the low, base and high capacity price forecasts. Clover and Mt. Storm both also have negative cash flows under a low capacity price forecast but have positive cashflows in the base and high scenarios.

Q What are the risks of keeping VCHEC, Clover, and Mt. Storm online until Dominion's modeled retirement dates beyond 2045?

A There are risks to reliability of continued reliance on thousands of MW of aging coal capacity. **[BEGIN CONFIDENTIAL]** [redacted][22] **[END CONFIDENTIAL]** Confidential Figure 2 below shows the recent historical and projected capacity factors for Dominion's coal-fired power plants.

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21 Dominion 2023 IRP at 83.

22 Calculated based on the Company's Response to Clean Virginia Discovery Request No. 1-03(f), Attachment CV Set 01-03(f) (JLM) CONF. This document contains voluminous spreadsheet data in numerous tabs and can be provided to the Commission and properly authorized parties upon request.

Confidential Figure 2. Historical and Projected Capacity Factors for Dominion's Coal Plants

[BEGIN CONFIDENTIAL]

[redacted]

[END CONFIDENTIAL]

Sources: Company's Response to Clean Virginia Discovery Request No. 01-04, Attachment CV Set 01-04(a)(b)(c)(d)(l)(m)(JLS); Company's Response to Clean Virginia Discovery Request No. 1-03(f), Attachment CV Set 01-03(f)(JLM) CONF. These documents contain voluminous spreadsheet data in numerous tabs and can be provided to the Commission and authorized parties upon request.

Dominion's projections of increasing utilization are concerning because coal units become more costly to maintain as they age and are more likely to break down and require repairs. Mt. Storm Units 1-3 came online in 1965, 1966, and 1973 and are almost 60 years old, while the Clover units came online in 1995 and 1996 and are nearly 30 years old.[23] By the end of the study period, the Mt. Storm plant will be

23 Dominion 2023 IRP Appendix 5A.

around 80 years old and the Clover plant will be around 50 years old. As shown in Confidential Table 5 below, outages rates at the Company's coal plants over the past five years (2018–2022, and the first half of 2023) have been **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** than the Company's fleet average outage rates. Each plant has had an outage rate above 10 percent in at least one of the past five years. As the plants age, it is expected that they will need to be shut down more often for repairs.

Confidential Table 5. Equivalent Forced Outage Rates for Dominion's Coal Plants vs. Fleet Average

	2018	2019	2020	2021	2022	2023	Avg.
Clover 1	3.1%	15.9%	11.8%	41.7%	1.2%	0.5%	12.3%
Clover 2	1.1%	7.6%	10.9%	7.8%	4.6%	7.9%	6.6%
Mt. Storm 1	2.6%	8.4%	3.9%	15.3%	15.2%	5.4%	8.5%
Mt. Storm 2	10.2%	11.4%	14.6%	4.0%	6.8%	0.9%	8.0%
Mt. Storm 3	14.3%	2.4%	6.2%	2.5%	11.0%	8.5%	7.5%
VCHEC	12.0%	10.5%	0.6%	1.7%	14.0%	0.1%	6.5%

[BEGIN CONFIDENTIAL]

[redacted]

[END CONFIDENTIAL]

Sources: Company Response to Clean Virginia Discovery Request No. 01-04, Attachment CV Set 01-04(a)(b)(c)(d)(l)(m)(JLS); Company's Response to Appalachian Voices Discovery Request No. 05-44(a), Attachment APV Set 05-44(a) (JEC) CONF. These documents contain voluminous spreadsheet data in numerous tabs and can be provided to the Commission and authorized parties upon request.

Q How do the resource additions compare between Dominion Plan B and the Synapse Optimized and 111(d)-Compliant Clean Energy scenarios?

A The Synapse scenarios add more renewables and less gas capacity than Dominion's Plan B. Table 6 below shows total installed capacity additions as of 2038 for Dominion's Plan D, Synapse's Optimized scenario, and Synapse's 111(d)-Compliant Clean Energy scenario. I also show the change in resource builds with NREL ATB costs used in place of Dominions costs; the resource builds in the Dominion Plan B are the same under both sets of cost assumptions.

Table 6. Comparison of Total Capacity in the Synapse Modeled Scenarios with Dominion Renewable Costs, 2038 (GW)

Resource Type	Dominion Plan B	Synapse Optimized		Synapse 111(d)-Compliant	
	DOM / ATB	DOM	Δ ATB	DOM	Δ ATB
Nuclear	4.3	3.5	-	3.5	-
Coal	2.7	2.1	-	0.0	-
Gas	13.0	12.3	-2.6	12.8	-3.1
Hydro	0.3	0.3	-	0.3	-
Biomass / Landfill / Other	0.2	0.2	-	0.2	-
Utility Solar	11.6	14.6	+14.2	15.3	+13.6
DG Solar	0.2	0.2	-	0.2	-
Pumped Hydro	1.8	1.8	-	1.8	-
Offshore Wind	5.2	7.8	-2.6*	7.8	-
Onshore Wind	0.3	0.3	-0.1	0.4	-0.2
Battery Storage	2.4	2.4	+4.8	3.3	+5.4
Total	42.0	45.5	+13.6	45.5	+15.6

**Note: Offshore wind project shifted from 2035 to 2039 in the optimized scenario; although that project does not appear in this table, it is still selected by the model in this scenario.*

In the Synapse scenarios, with the relaxation of the build limits on solar and battery storage, the model retires more coal and builds more clean energy resources than is seen in Dominion's Plan B. When I used the more realistic NREL ATB costs assumptions, the model built less gas capacity and more solar PV and battery storage as part of the least-cost resource mix in both the Synapse Optimized and the Synapse 111(d)-Compliant Clean Energy scenarios. The model also shifted back the third offshore wind project by a few years and instead opted to build more solar PV and battery storage earlier in the planning period.

Q How do the resource additions differ by year between Dominion Plan B and the Synapse 111(d)-Compliant Clean Energy scenarios?

A As shown in Table 7, the resource build-outs are different between the Synapse 111(d)-Compliant Clean Energy scenario and Dominion's Plan B, and the mix shifts even more away from firm capacity resources[24] and to clean energy resources when NREL ATB costs are used for renewables in place of Dominion's cost assumptions.

24 I modeled a CT as a placeholder for a firm capacity resource because the costs and operational characteristics of CTs are relatively well known. We anticipate, however, that Dominion will have access to an increasing array of technologies capable of providing firm capacity without the environmental impacts and fuel considerations of gas CTs.

Table 7. Annual Cumulative Capacity Additions (MW) by Resource Type

	Dominion Plan B			Synapse 111(d)-Compliant Clean Energy Scenario: Dominion Costs			Synapse 111(d)-Compliant Clean Energy Scenario: ATB Costs		
Year	Firm Capacity Resource	Utility Solar	Battery Storage	Firm Capacity Resource	Utility Solar	Battery Storage	Firm Capacity Resource	Utility Solar	Battery Storage
2023									
2024									
2025									
2026									
2027		600						1,800	
2028	1,046	1,257	90				0	3,591	
2029	1,046	1,911	210				0	5,973	
2030	1,046	2,621	360		2,400		0	8,343	
2031	1,046	3,508	540	523	4,788		0	10,701	720
2032	1,046	4,391	720	1,046	4,864		0	13,048	1,920
2033	1,046	5,269	960	2,615	4,840		0	15,383	3,120
2034	1,046	6,142	1,200	3,138	4,816	120	0	17,706	4,320
2035	1,569	7,012	1,470	3,138	6,211	700	0	20,017	5,520
2036	2,092	7,876	1,770	3,138	8,580	700	0	22,317	6,720
2037	2,615	8,737	2,070	3,138	10,938	1,900	0	24,606	7,880
2038	3,138	9,593	2,370	3,138	13,283	3,100	0	26,883	8,640

Note: In all three scenarios, the model adds 2 tranches of 2,600 MW of offshore wind in each of 2027 and 2033. In the 111(d)-Compliant scenarios, the model adds a third tranche in 2035 (assuming Dominion renewable costs) and 2038 (NREL ATB renewable costs).

In Plan B, Dominion hard-codes in the addition of one set of new CTs in 2028,[25] and the model endogenously adds several more beginning in 2035. Plan B also adds 9,840 MW of solar PV, 5,200 MW of off-shore wind, 300 MW of onshore wind, and 2,370 MW of storage by 2038.

25 *See* Exhibit DG-3.

In the Synapse 111(d)-Compliant Clean Energy scenario, the model does not start adding firm capacity resources until after 2030 using Dominion cost assumptions, and the model waits until after 2038 (beyond the planning period) when I use the more realistic and current NREL ATB cost assumptions. By 2038, the model adds over 13,200 MW of solar PV, 7,800 MW of offshore wind, 400 MW of onshore wind, and 3,170 MW of battery storage. This is 3,000 MW more solar and 500 MW more battery storage than in Dominion Portfolio B. The solar PV and battery storage additions jump to nearly 27,000 MW of solar and 8,600 MW of battery storage when I use the NREL ATB Cost assumptions in the Synapse scenario.

Figure 3 and Figure 4 below show the installed capacity for Dominion Plan B and the 111(d)-Compliant Clean Energy scenario. Figure 5 shows the installed capacity for the 111(d)-Compliant Clean Energy scenario with the ATB cost assumptions.

Figure 3. Dominion Plan B Scenario Nameplate Capacity by Resource Type

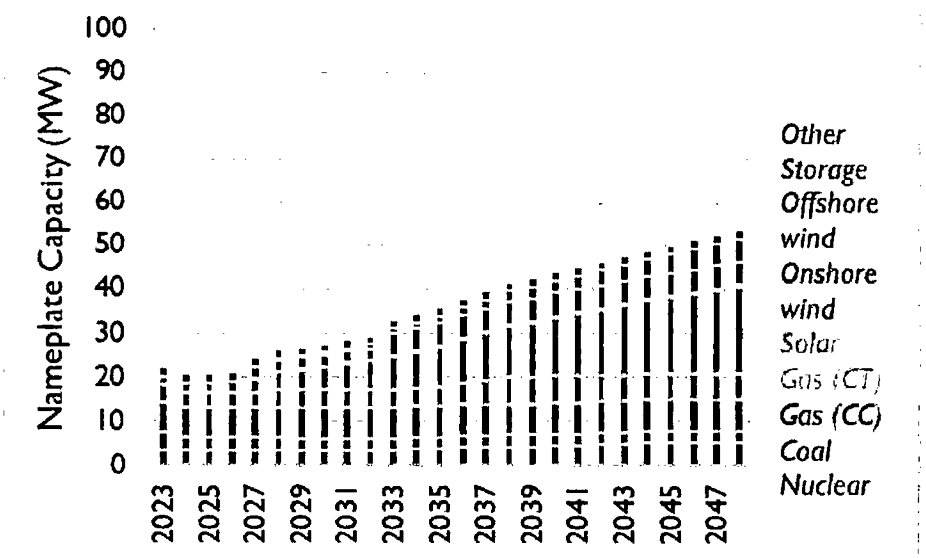


Figure 4. Synapse 111(d)-Compliant Clean Energy Scenario Nameplate Capacity by Resource Type (Dominion Costs)

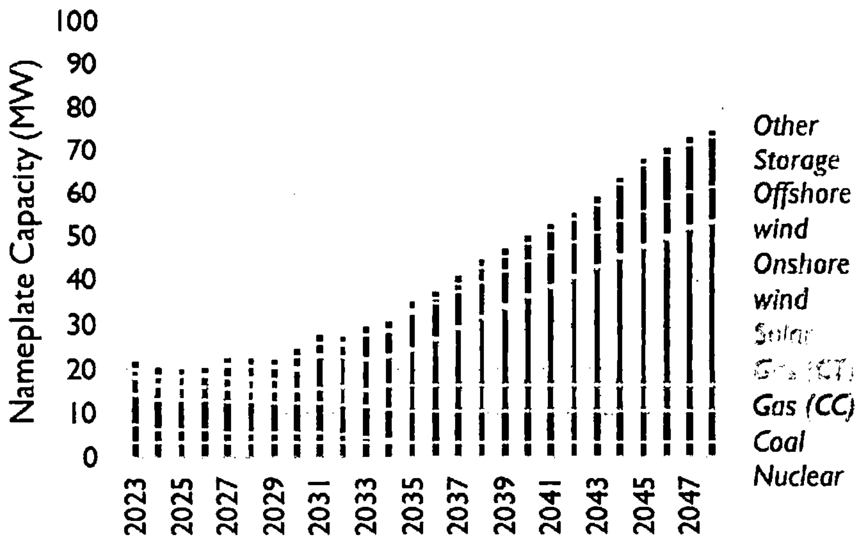
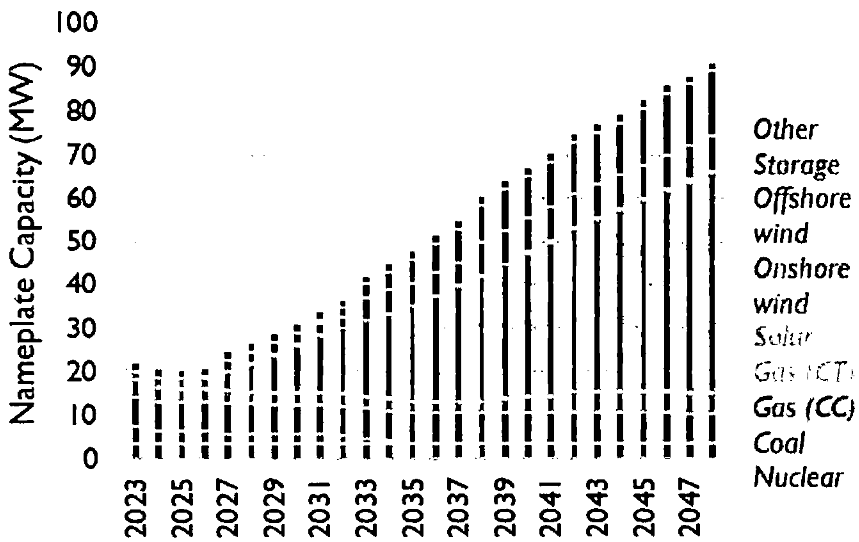


Figure 5. Synapse 111(d)-Compliant Clean Energy Scenario Nameplate Capacity by Resource Type (NREL ATC costs)



Q Why did the model wait until 2030 to start adding solar PV in the Synapse 111(d)-Compliance Scenario?

A In the Synapse 111(d)-Compliant Scenario, the model sees solar PV costs falling until around 2030, when they begin to flatten out. Based on that cost trajectory, and the model's foresight, the model opts to wait until 2030 to begin building out solar PV. This is not necessarily the best option for Dominion, in light of realities of solar development in the market today, including project delays, and when considering the alternative energy sources, which are subject to price volatility. All of these factors are not fully captured in the scenarios I modeled (fuel and market price volatility can be captured in the model with additional model runs).

Q How did generation levels by resource type differ between Plan B and the Synapse scenarios?

A Generation from coal and gas is higher in Plan B than in the Synapse scenarios. In the Dominion Plan B scenario, coal generation increases in the 2030s and remains high into the 2040s. Gas generation also increases. Solar and wind generation increase, but these only supply approximately 28 percent of Dominion's load in 2048. In the Synapse 111(d)-Compliant Clean Energy scenario, solar and wind generation increases more quickly and coal generation falls to zero as the last of the coal plants retire by 2035. This trend of increasing renewable generation is even more pronounced for the Synapse scenario when I use the more realistic and up-to-date NREL ATB costs in place of the Dominion resource costs. Figure 6 and Figure 7 below show the generation results of the Dominion Plan B and the

Synapse 111(d)-Compliant Clean Energy scenario. Figure 8 shows the Synapse scenario with NREL ATB costs.

Figure 6. Dominion Plan B Scenario Generation by Resource Type

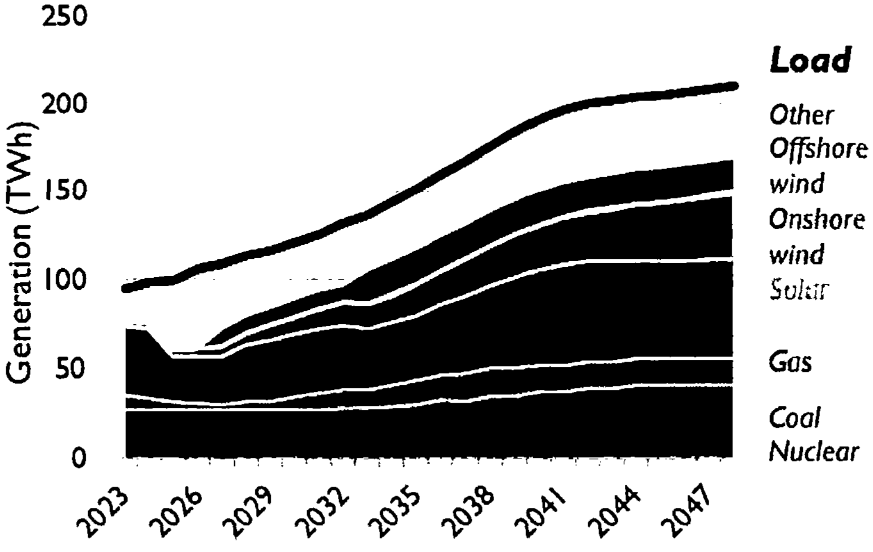


Figure 7. Synapse 111(d)-Compliant Clean Energy Scenario Generation by Resource Type (Dominion Costs)

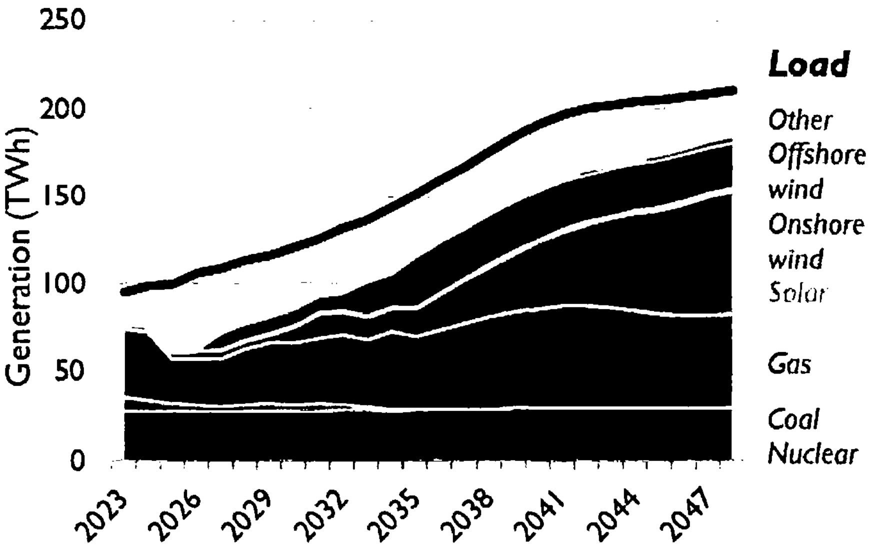
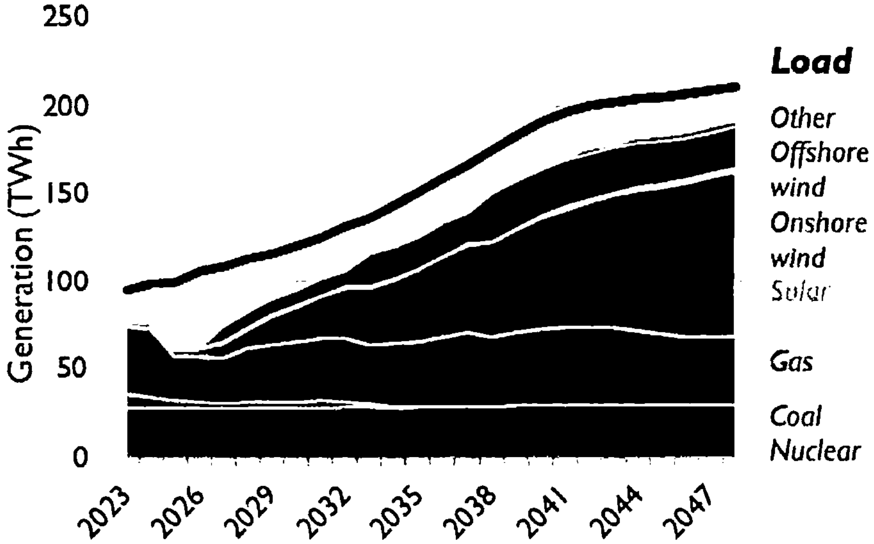


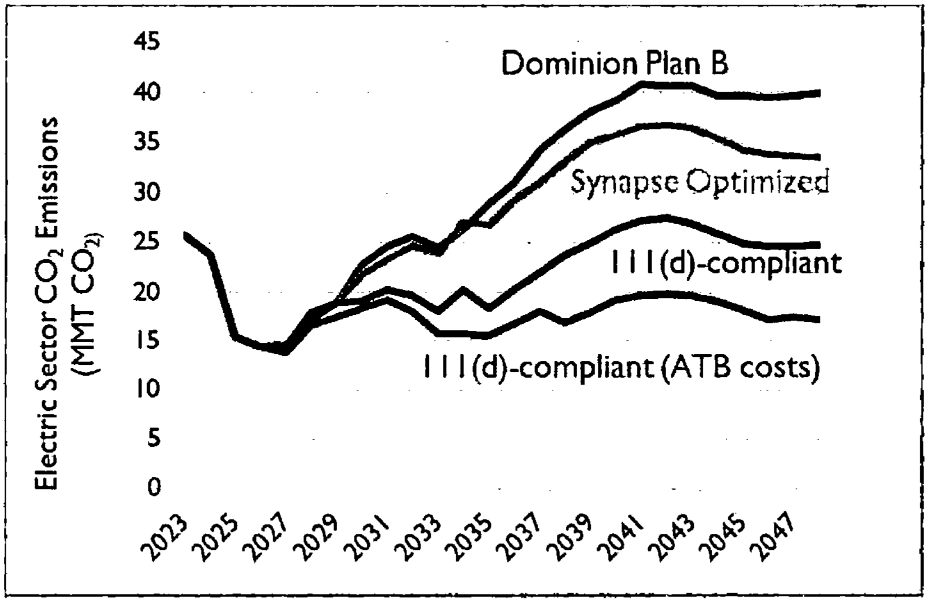
Figure 8. Synapse 111(d)-Compliant Clean Energy Scenario Generation by Resource Type (NREL ATB Costs)



Q How do CO_2 emissions compare between Dominion's Plan B and Synapse's scenarios?

A CO_2 emissions were lower in both Synapse scenarios. The Synapse Optimized scenario sees lower emissions—particularly after 2035, when solar, wind, and storage capacity increase faster than in the Dominion Plan B scenario. Dominion's emissions fall even lower with the 111(d)-Compliant Clean Energy scenario, and when NREL ATB costs are used for new renewables, emissions fall greater still.

Figure 9. Dominion Greenhouse Gas Emissions by Modeled Scenario



Note: Figure does not reflect emissions from imports.

Q How did the revenue requirement and total system costs compare between Dominion's Plan B and Synapse's scenarios?

A The total cost to ratepayers is $4.1 billion lower in the Synapse 111(d)-Compliant Clean Energy scenario than in Dominion's Plan B, as shown below in Table 8. NPVRR ($2023) of Synapse Modeled Scenarios (2023–2048) even when using Dominion's renewable cost assumptions.

Table 8. NPVRR ($2023) of Synapse Modeled Scenarios (2023–2048)

Cost Category	Dominion Plan B ($B)	Synapse Optimization ($B)	Synapse 111(d)-Compliant ($B)
Operating Cost	$91.6	$88.1	$89.2
Property Taxes	$0.8	$0.7	$0.8
Other Costs	$0.7	$0.9	$0.9
Book Depreciation	$8.3	$11.4	$12.5
Allowed Return	$2.9	$(1.2)	$(0.5)
RPS Penalties	$3.6	$0.1	$0.1
Interconnection	Included	Included	Included
Integration	$1.1	$2.1	$2.1
REC Purchases	$1.5	$1.5	$1.4
Total Cost	**$110.5**	**$103.5**	**$106.4**

Q **How did your results change with lower solar and battery storage capital costs?**

A The revenue requirement difference between Dominion Plan B and the Synapse 111(d)-Compliant Clean Energy scenario widens with lower clean energy costs. In the NREL ATB cost sensitivities, clean energy portfolios become even more economic compared with Dominion's Plan B scenario, demonstrating the risk of deploying solar and battery storage too slowly. As shown in Table 9 below, operating costs are far lower in the Synapse Optimized and Synapse 111(d)-Compliant Clean Energy scenarios with the NREL ATB solar and storage capital costs. After accounting for savings on RPS penalty costs, the Synapse 111(d)-Compliant Clean Energy scenario is actually $9.0 billion less expensive than Dominion's Plan B.

Table 9. NPVRR ($2023) of Synapse Modeled Scenarios with NREL ATB Solar and Storage Capital Costs (2023-2048)

Cost Category	Dominion Plan B ($B)	Synapse Optimization ($B)	Synapse 111(d)-Compliant ($B)
Operating Cost	$91.6	$79.0	$79.0
Property Taxes	$0.8	$0.3	$0.5
Other Costs	$0.5	$0.8	$0.9
Book Depreciation	$5.5	$12.0	$13.2
Allowed Return	$(0.9)	$(6.3)	$(6.4)
RPS Penalties	$3.6	$0.1	$0.1
Interconnection	$1.6	$5.2	$5.3
Integration	$1.1	$3.4	$3.4
REC Purchases	$1.5	$0.3	$0.3
Total Cost	**$105.2**	**$94.7**	**$96.2**

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

A Data center load is driving the need for substantial new capacity and is driving the need to keep existing coal and gas resources online. The RPS under the VCEA is driving the renewable build-out. The model wants as much renewable and battery storage as it can get once you get into the 2030s. And a clean energy portfolio that retires all of Dominion's coal by 2035 is lower cost than the Company's current plan to keep all remaining fossil units online beyond 2045. Assuming clean energy costs continue to fall and interconnection queue back-ups are cleared, the savings to Dominion ratepayers from investing in renewables will grow even larger.

Q **What should the Commission understand about the impact of data center load growth on its system and ratepayers?**

A Data center load growth is driving Dominion to keep its existing coal plants online for longer than previously planned, build out new gas in the 2030s, and pay large

RPS penalties. It is not in the best interest of Dominion ratepayers to continue investing money in aging fossil infrastructure and new fossil infrastructure, that may become stranded assets in 2045, and paying large RPS penalties; instead, Dominion should be using that money to build new, clean energy resources.

Q **What impact does the RPS under the VCEA have on Dominion's modeling results?**

A Dominion has to either build renewables to meet the RPS or pay a penalty when it falls short. But Dominion is limiting the amount of solar PV and battery storage the model can add each year and opting to pay an RPS penalty later in the study period. While it is reasonable for Dominion to place some limits on the quantity of batteries and solar PV it can add in each year, the limits Dominion has placed on the model—especially beyond 2030—are simply too low and are not justified. Starting in 2031 for solar and 2036 for battery storage, the model is choosing to build as much resource as it is allowed, and then paying the penalty for all remaining RPS requirements. By maxing out the amount of each renewable resource that it can add, the model is showing that the build limit, not resource economics, is the limiting factor here. This means that building out more renewables and battery storage is actually a lower cost option than paying the RPS penalty.

Q **What are your recommendations on unit retirements?**

A Dominion should retire the VCHEC and its coal plants as soon as possible, but no later than 2027 for VCHEC, 2032 for Clover and 2035 for Mt. Storm. Doing so will allow Dominion to avoid incurring ongoing operations and maintenance costs (O&M), sustaining capital costs, and environmental compliance costs at its aging fossil units—and allow it to invest instead in new, RPS-compliant clean energy resources.

Q What are your recommendations on new resource additions?

A Dominion should issue RFPs and begin to procure solar PV to meet the growing data center load and allow the immediate retirement of VCHEC. Higher renewable costs over the past few years did slow the pace of renewable deployment, but costs are now falling and barriers to deployment are lifting. Synapse's analysis shows that Dominion needs to be planning for the retirement of its coal fleet over the next decade or sooner, and to do that it needs to procure clean energy replacement resources.

5. ECONOMIC & REGULATORY FACTORS IMPACTING THE IRP

Q Explain the data center load growth that is driving the need for Dominion to build out a significant quantity of new resources.

A Dominion is projecting unprecedented data center load growth in the region over the next decade in its 2023 IRP. Specifically, the PJM Load Forecast projects Dominion's peak demand will grow by nearly 5 percent and energy load will grow by around 7 percent over the next decade.[26] This is a substantial deviation from

26 Dominion 2023 IRP at 2.

the level of load growth that Dominion projected in its 2020 IRP. It is concerning that Dominion has just now started to plan for data center load growth, when the build-out of data centers has been occurring at a rapid pace in the region for years.

Q **How does the projected data center load growth impact Dominion's RPS requirement?**

A As load grows, so does Dominion's RPS obligation. In the 2020 IRP, Dominion's load forecast was much lower, and therefore the quantity of renewables it needed to build to meet its RPS was much lower. But with the 2023 IRP, the massive jump in load has also increased the RPS requirement. To meet its RPS, Dominion has to either build out large amounts of renewables or pay a large RPS penalty. In the model, Dominion places strict limits on solar and battery storage deployment, so in Plan B Dominion has no choice but to pay penalties to meet the RPS requirement. As discussed above, in the Synapse scenarios, I raised the build limits and used renewable resources to meet Dominion's RPS requirement.

Q **How does the data center load growth impact Dominion's resource planning and its ratepayers?**

A Previously, Dominion planned to retire the Clover coal plant in 2025 and several gas plants in the later 2020's. But in the 2023 IRP, Dominion has reversed course and decided to keep all its existing fossil units online throughout the entire study period. This is because Dominion's modeling shows that it needs the energy and capacity from these plants to meet its growing data center load forecast. But my modeling shows that it is not in the best interests of Dominion ratepayers for the

Company to extend the life of aging fossil resources and incur substantial RPS penalties, the cost of which will be passed on to Virginia ratepayers, simply to meet data center load. Although this is outside the purview of the IRP, Virginia should be incentivizing or even requiring data centers to invest in technologies to reduce their energy demand and should require them to play a role in procuring at least some of their own renewables. It is not clear that it is in the best interest of Virginia ratepayers to have Dominion solely responsible for building and procuring all resources needed to meet 100 percent of projected data center load growth.

Q **Did Dominion incorporate its RPS penalties accurately into its IRP?**

A No. I found an error in how Dominion calculated its RPS requirement and the associated penalties for falling short. Specifically, Dominion overstated the contribution of renewable purchases by Advanced Renewable Buyers (ARB) program and the impact ARB credits had in reducing its RPS requirements. The impact of this error was Dominion undercounting its RPS penalty in Plan B in its IRP by $1 billion. Dominion admitted to this mistake in a discovery response.[27]

27 Company's Response to Sierra Club Discovery Request No. 8-1, attached as Exhibit DG-7.

Q Why did you increase the renewable build limits and model a lower capital cost sensitivity?

A Because renewable costs are starting to come down and the regulatory bottlenecks that have slowed renewable deployment over the past several years are easing. This represents a shift in the market even from a few months ago.

Q Explain the trends you are seeing in falling renewable costs today.

A A report published by LevelTen Energy on July 17, 2023, found that solar power purchase agreement prices fell by around 1 percent (in aggregate) across the United States in the second quarter of 2023, following three years of large price increases. The report goes on to state that the aggregate 1 percent decline is actually composed of much larger declines in most parts of the country and was skewed upward by a 14 percent price jump in Texas due to their unstable legislative climate.[28] Thus for non-Texas regions in the aggregate, the price decline is greater than 1 percent.

Q Does this trend make sense to you?

A Yes, absolutely. As has been seen in previous trajectories of clean energy technology costs, underlying fundamental drivers of lower real costs for solar, wind, and battery energy storage arise from economies of scale, scope, and improvements in technologies. The trend of lower costs for these resources is re-

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28 Emma Penrod, *Solar PPA Prices Drop for First Time Since Onset of COVID-19: LevelTen*, UTILITY DIVE (July 18, 2023), available at https://tinyurl.com/bdcy4u98.

establishing prominence over the shorter-term disturbances seen in the cost trends that arose from the aftermath of the pandemic and related supply chain pressures and inflationary increases.

Q Explain the recent generation interconnection reform.

A On July 27, 2023, the Federal Energy Regulatory Commission (FERC) issued an order on Improvements to Generators Interconnection Procedures and Agreements. This order adopts reforms to (1) implement a first-ready, first-served cluster study process; (2) speed up interconnection queue processing; (3) incorporate technological advancements into the interconnection process; and (4) establish an effective date and a transition process.[29] These reforms are expected to alleviate the interconnection backlog in PJM and speed up project approval timelines in the future.

Q Is there enough land in Virginia for Dominion and/or the data centers to build solar PV to meet their energy needs?

A Yes. I understand there has been concern in the past by the Company that solar PV requires a large land footprint. A study of solar siting in Virginia by the Nature Conservancy found[30] that there is around 6.48 million acres of land potentially

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29 FEDERAL ENERGY REGULATORY COMMISSION, *Fact Sheet: Improvements to Generators Interconnection Procedures and Agreements* (July 27, 2023), available at https://tinyurl.com/nhjhhjpc.

30 THE NATURE CONSERVANCY, *Solar Siting in Virginia* (March 2021), available at https://tinyurl.com/2p87bd6v.

suitable for solar development. To meet the VCEA goal of 16,100 MW of solar PV would require roughly 161,000 acres of land. To meet the Synapse 111(d) Scenario, would require roughly double that quantity of incremental land. In both scenarios, that is much less than the total suitable land available in the state

Q Explain the recently proposed Section 111(d) and (b) Rules, and the impact the proposed Rules will have on both existing and new fossil resources.

A The proposed Rules apply to both coal- and gas-fired units, existing and new, and provides multiple pathways for compliance. These pathways differ based on: (1) whether the unit is coal or gas; (2) whether the unit is existing or new; (3) how much the unit runs; and (4) when the unit is scheduled to retire. Dominion does not contemplate any new coal in its IRP, so the Rule would apply only to Dominion's existing coal, existing gas, and new gas resources.

Q Did Dominion model compliance with greenhouse gas regulations in its 2023 IRP?

A No. Dominion filed its IRP on May 1, 2023. The EPA announced its proposed Greenhouse Gas Standards for New and Existing Generation Units under Section 111 of the Clean Air Act 10 days later on May 11, 2023. Given this timing, it would have been impossible for Dominion to model compliance with the proposed Section 111 Rules in its original IRP.[31] But given the large impact of the proposed

31 Company's Response to Sierra Club Discovery Request No. 3-4, attached as Exhibit DG-8.

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rule, Dominion should be actively evaluating how the proposed rule will impact its plan to keep its existing coal and gas plants online and to build out new CTs. Table 10 below shows the 111(d) compliance options available to Dominion at its coal plants, based on their current planned retirement dates.

Table 10. Section 111 Compliance Options at Dominion's Existing Coal Units Based on Plan B Retirement Dates

	Plan B		Synapse 111(d)-Compliant	
Coal Unit	**Retirement Date (EOY)**	**111 Compliance Option**	**Retirement date (EOY)**	**111 Compliance Option**
Chesterfield 5	2023	Exempt	2023	Exempt
Chesterfield 6	2023	Exempt	2023	Exempt
Clover 1	>2040	90% CCS in 2030	2031	Exempt
Clover 2	>2040	90% CCS in 2030	2031	Exempt
Mt. Storm 1	>2040	90% CCS in 2030	2032	20% CF limit
Mt. Storm 2	>2040	90% CCS in 2030	2033	20% CF limit
Mt. Storm 3	>2040	90% CCS in 2030	2034	20% CF limit
VCHEC	>2040	90% CCS in 2030	2026	Exempt

Source: Synapse analysis based on planned unit retirement dates in 2023 IRP.

Synapse evaluated the impact of the rule in one of our scenarios. We assumed that the Company will not consider CCS at this point, based on its discovery response indicating the existence of critical constraints on storing captured carbon that limiting CCS's commercial viability.[32] We also assumed that the Company would not invest in new gas pipeline infrastructure at either Clover or Mt. Storm to allow the plants to co-fire on natural gas and operate through 2040, given the projected

32 Company's Response to Sierra Club Discovery Request No. 3-5, attached as Exhibit DG-9.

cost of the pipeline extension required ($600 million and $370 million respectively in $2022)[33] and the plant conversion and the limited time the gas infrastructure would be in use due to the VCEA's requirement that all fossil-fueled generation be retired by 2045. Table 10 above shows the compliance options we modeled.

Q **Are there any other current or proposed rules that will impact Dominion's existing resources?**

A Yes, the EPA proposed a more stringent Mercury Air Toxins rule on April 23, 2023. This rule would strengthen the filterable particulate matter pollutant emission standard from 0.030 pounds per million British thermal of heat input (lb/MMBtu) to 0.010 lb/MMBtu for all existing coal-fired electric utility steam generating units. EPA is also soliciting comments on an even more stringent standard of 0.006 lb/MMBtu or lower.[34] The EPA has already determined that plants such as Mt. Storm that use electrostatic precipitators to control particulate matter will need to upgrade their electrostatic precipitators to comply with the 0.010 lb/MMBtu standard; they will also have to install fabric filters to comply

33 ENVIRONMENTAL PROTECTION AGENCY, *Documentation for Power Sector Modeling Platform v.5.13* at Table 5-22: Cost of Building Pipelines to Coal Plants (November 27, 2013), available at https://tinyurl.com/6wvrpxrr.

34 *National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review*, 88 FEDERAL REGISTER 24854 (Proposed April 24, 2023), available at https://bit.ly/43emrFx.

with the 0.006 lb/MMBtu standard.[35] At a minimum, Dominion will need to implement potentially costly upgrades to comply with this standard and may need to install a new baghouse at Mt. Storm, which would require major capital investments. Mt. Storm is, in fact, one of only a few plants in the United States that will not be able to meet the proposed standard without upgrades.

In addition, EPA's proposed March 2023 Supplemental Steam Electric Effluent Limitations Guidelines and Standards Rule (Supplemental ELG Rule) includes a zero-discharge requirement and a proposed combustion residual leachate discharge requirement.[36] Dominion claims the bottom ash transport water system it is currently installing should meet the zero-discharge requirement, but the Company has been silent on the combustion residual leachate discharge requirements. Its current system likely does not meet those requirements, and compliance will require future plant upgrades.[37] Admittedly, those upgrades will be required regardless of when Mt. Storm retires. But the Supplemental ELG Rule illustrates EPA's continuing effort to rein in the disproportionate environmental footprint of coal-fired generation. It also highlights the importance of transparent,

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35 ENVIRONMENTAL PROTECTION AGENCY, *2023 Technology Review for the Coal- and Oil-Fired EGU Source Category* (2023), available at https://bit.ly/3Mij2yR.

36 *See Petition of Virginia Electric & Power Company for Revision of Rate Adjustment Clause Rider E etc.*, Case No. PUR-2023-00005, Direct Testimony of Devi Glick on Behalf of the Sierra Club at Exhibit DG-8 (May 23, 2023), available at https://tinyurl.com/2rya8afz.

37 *Id.* at Exhibit DG-9.

forward-looking decision-making for plants subject to increasingly stringent regulations.

Q What are your main take-aways from this IRP and the resource planning modeling the Company performed?

A Dominion classifies the results of each IRP exercise as showing just a snapshot in time. Each snapshot is only as accurate as the data available to model and the modeling decisions made by the Company at the time the modeling exercise is completed. In the 2023 IRP, Dominion is facing projections of unprecedented data center load growth for its service territory over the next several decades, challenges with VCEA compliance, increasing federal regulations of fossil fuel plants and incentives for renewable deployment, a renewable industry recovering from a period of supply chain challenges and record inflation, and interconnection backlogs in PJM delaying renewable deployment in the region. All of these factors make the current planning environment more uncertain and unstable than normal.

This does not mean that the modeling exercise is not useful, but rather that to make it useful Dominion needs to focus on what resource decisions are robust even in light of this uncertainty. The Commission has previously recognized the need for detailed analysis in support of resource decisions is even more important in moments of "significant uncertainty."[38]

Dominion needs to critically review its modeling and see that, despite uncertainty, the results show that the solution is not to continue relying on its existing fossil coal and gas units but rather—reflecting ratepayers' best interest—to deploy as much renewable energy and battery storage as soon as possible.

Q **Does this conclude your testimony?**

A Yes.

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38 *Petition of Virginia Electric & Power Company for Approval of Rate Adjustment Clause Rider E*, Case No. PUR-2018-00195, Order on Reconsideration at 6 n.21 (November 14, 2019), available at https://tinyurl.com/khxf5pbe.

INDEX OF EXHIBITS

Exhibit No.	Description of Exhibit
Exhibit DG-1	Resume of Devi Glick
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Exhibit DG-3	Company's Response to Appalachian Voices Discovery Request No. 3-6
Exhibit DG-4	Company's Response to Clean Virginia Discovery Request No. 3-28
Exhibit DG-5	Company's Response to Sierra Club Discovery Request No. 2-12(a)
Exhibit DG-6	Company's Response to Commission Staff Discovery Request No. 1-65
Exhibit DG-7	Company's Response to Sierra Club Discovery Request No. 8-1
Exhibit DG-8	Company's Response to Sierra Club Discovery Request No. 3-4
Exhibit DG-9	Company's Response to Sierra Club Discovery Request No. 3-5
Exhibit DG-10	Company's Response to Commission Staff Discovery Request No. 1-23.

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EXHIBIT DG-1

Resume of Devi Glick

Synapse
Energy Economics, Inc.

Devi Glick, Senior Principal

Synapse Energy Economics I 485 Massachusetts Avenue, Suite 3 I Cambridge, MA 02139 I 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 surrebuttal 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

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.

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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.

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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.

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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.

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

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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, 2021.

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, 2021.

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. 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 Cost §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 Evergy 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 Evergy 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 Utilties 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.

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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 Mater 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. 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 January 2023

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EXHIBIT DG-2

Company's Response to Commission Staff Discovery Request No. 9-194

23081 0216

Virginia Electric and Power Company
Case No. PUR-2023-00066
Virginia State Corporation Commission Staff
Set 9

The following response to Question No. 194 of the Ninth Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on July 20, 2023, was prepared by or under the supervision of:

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

As it pertains to legal matters, the following response to Question No. 194 of the Ninth Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on July 20, 2023, was prepared by or under the supervision of:

Vishwa B. Link
McGuireWoods LLP

Question No. 194

Please refer to § 56-585.5 D and E of the Code of Virginia. Identify which plan or plans (Alternative Plans B, C, D, and/or E) envision achieving the requirements of the referenced Code section as it pertains to the requirement that the Company propose 16,100 MW of solar and/or onshore wind generation (*see* Code § 56-585.5 D 2) and 2,700 MW of energy storage resources (*see* Code § 56-585.5 E 2). Please also specify whether the Company instructed the model to select the 16,100 MW of solar and/or onshore wind and 2,700 MW of storage resources, or if the model selected, on a least-cost optimization basis, the 16,100 MW of solar and/or onshore wind and 2,700 MW of onshore wind.

Response:

The Company objects to this request to the extent it seeks a legal conclusion. The Company also objects to this request to the extent it seeks information that may be protected by the attorney client privilege, work product doctrine, or other recognized privilege. Subject to and notwithstanding these objections, the Company provides the following response.

Plans B and D include the significant development of solar, wind, and energy storage resources envisioned by the VCEA. The VCEA development targets were required in Plans B and D through 2038. In Plans C and E, all new resources were selected on a least-cost optimized basis without regard for the VCEA development targets. See Section 2.2 of the 2023 Plan and the Company's response to APV Set 03-06.

2308102161

EXHIBIT DG-3

Company's Response to Appalachian Voices Discovery Request No. 3-6

Virginia Electric and Power Company
Case No. PUR-2023-00066
Appalachian Voices
Set 3

The following response to Question No. 6 of the Third Set of Interrogatories and Requests for Production of Documents propounded by Appalachian Voices received on May 19, 2023, was prepared by or under the supervision of:

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

Question No. 6

For each plan contained in the 2023 IRP (Plans A through E), please provide the following:
(a) identify for each generation and storage resource whether the resource was selected by the PLEXOS model on a least cost optimization basis in the model simulations; and
(b) identify those energy or storage resources that Dominion instructed the model to select.

Response:

Plan A: Unit selection is selected or least-cost optimized but this Plan meets only applicable carbon regulations and mandatory RPS program requirements of the VCEA.
Plan B: VCEA development targets required through 2038. A single set of combustion turbines ("CTs") included in 2028. A second tranche of offshore wind is included in 2033. The remaining plan is selected or least-cost optimized.
Plan C: This plan is entirely selected or least-cost optimized.
Plan D: VCEA development targets required through 2038. A single set of CTs included in 2028. A second tranche of offshore wind is included in 2033. All unit retirements are included. The remaining plan is selected or least-cost optimized.
Plan E: Fossil generation retirements are required in this plan. The remaining plan is selected or least-cost optimized.

230810216

EXHIBIT DG-4

Company's Response to Clean Virginia Discovery Request No. 3-28

Virginia Electric and Power Company
Case No. PUR-2023-00066
Clean Virginia
Set 3

The following response to Question No. 28 of the Third Set of Interrogatories and Requests for Production of Documents propounded by Clean Virginia received on July 18, 2023, was prepared by or under the supervision of:

Vishwa B. Link
McGuireWoods LLP

Question No. 28

Please list the Company's obligations under the VCEA regarding renewable energy resources, including:

a. The amounts of solar, onshore wind, and offshore wind (or any combination thereof) that the Company will have to build or procure by each compliance date.

b. Do any of the Company's alternative plans achieve the amounts of solar, onshore wind, and offshore wind (or combinations thereof) that comply with the VCEA requirements for renewable energy resources by each compliance date?

   i. If so, please explain which plans comply and provide calculations in Excel format with formulae intact that show how compliance is achieved in the compliant plan.

   ii. If not, please explain.

Response:

The Company objects to this request to the extent it seeks a legal conclusion. The Company also objects to this request to the extent it seeks information that may be protected by the attorney client privilege, work product doctrine, or other recognized privilege. Finally, the Company objects to this request to the extent it requires original work. Notwithstanding and subject to these objections, the Company provides the following response.

a. See Va. Code §§ 56-585.5 and 56-585.1:11.

b. See Section 2.2 of the 2023 Plan.

23081021

EXHIBIT DG-5

Company's Response to Sierra Club Discovery Request No. 2-12(a)

Virginia Electric and Power Company
Case No. PUR-2023-00066
Sierra Club
Set 2

The following response to Question No. 12 of the Second Set of Interrogatories and Requests for Production of Documents propounded by the Sierra Club received on June 6, 2023, was prepared by or under the supervision of:

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

As it pertains to legal matters, the following response to Question No. 12 of the Second Set of Interrogatories and Requests for Production of Documents propounded by the Sierra Club received on June 6, 2023, was prepared by or under the supervision of:

Vishwa B. Link
McGuireWoods LLP

Question No. 12

For each Plan and Retirement Case, please provide the following for each existing and new fossil power plant:

(a) The assumed retirement year, indicating whether the retirement year was programed in or selected by the model.

(b) The projected capacity factor for each units, for all scenarios, for all years of the analysis period, indicating whether any of the capacity factors were programed or if they were all produced by the model.

(c) Whether each resource was modeled with an economic (market) or self-commitment (must run) status for each year of the analysis.

Response:

(a) For Plans A, B, and C, the retirements of units were allowed to be selected economically, and no units were selected to retire in these plans. For Plans D and E, the unit retirements were programmed to meet a glide path to retirement of all Company-owned carbon-emitting generation by the end of 2045, resulting in zero carbon dioxide ("CO_2") emissions from the Company's fleet in 2046. The retirement years for fossil units in Plans D and E are shown in Figures 2.2.4 and 2.2.5 of the 2023 Plan.

(b) The Company objects to this request because "all scenarios" is vague and undefined. Subject to and notwithstanding this objection, the Company provides the following response assuming that "all scenarios" means the Company's Alternative Plans.

Please see Attachment Sierra Club Set 02-12 (JLM). The capacity factors ("CF") for all units were produced by the model with maximum and minimum capacity factor constraints for some units as shown in Attachment Sierra Club Set 02-09(e) (JLM) CONF.

(c) The Company objects to the premise of this request as vague because it connects "must-run" resources with the selection of a unit in the PLEXOS model, which are unrelated concepts. "Must-run" is a dispatch operational status the Company uses within PJM to offer its generation units in the day-ahead and real-time capacity markets. In the PLEXOS model, units are either included (*i.e.*, the model is instructed to select the resource) or selected (*i.e.*, least-cost optimized). To the extent the request seeks information regarding the operational characteristics of the units selected or included in the model, the Company provides the following response.

Certain units are either required to or expected to run as baseload units or are non-dispatchable renewable units with fixed generation profiles. All nuclear units modeled in 2023 Alternative Plans are modeled as non-dispatchable units based on either their low variable costs or technical design, which requires them to run as baseload units. Renewable units such as solar, wind, and run of river hydro are also modeled as non-dispatchable or "must take" (*i.e.*, when online, the grid must take the energy generated) units via a fixed generation profile. All other units are modeled to dispatch economically based on expected fuel, variable, and emissions costs.

EXHIBIT DG-6

Company's Response to Commission Staff Discovery Request No. 1-65

Virginia Electric and Power Company
Case No. PUR-2023-00066
Virginia State Corporation Commission Staff
Set 1

As it pertains to interconnection viability and project availability, the following response to Question No. 65 of the First Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on June 2, 2023, was prepared by or under the supervision of:

Kelsi C. Jewell
Business Development Manager
Dominion Energy Virginia

As it pertains to construction capacity and supply chain constraints, the following response to Question No. 65 of the First Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on June 2, 2023, was prepared by or under the supervision of:

Corey Riordan
Project Construction Controls Consultant
Dominion Energy Services, Inc. (co-sponsored by)

Question No. 65

Why did the Company find it necessary to impose limitations on the PLEXOS model regarding the total MW of storage added per year, as seen on page 40 of the IRP?

Response:

The Company puts annual build limitations into the PLEXOS model to account for a realistic build scenario taking into consideration supply chain constraints, construction capacity, interconnection viability, and availability of projects.

EXHIBIT DG-7

Company's Response to Sierra Club Discovery Request No. 8-1

230810216

Virginia Electric and Power Company
Case No. PUR-2023-00066
Sierra Club
Set 8

The following response to Question No. 1 of the Eighth Set of Interrogatories and Requests for Production of Documents propounded by Sierra Club received on July 26, 2023, was prepared by or under the supervision of:

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

Question No. 1

Please refer to Attachment Staff Set 01-44 (JLM):

(a) Please explain why there are two different ARB trajectories modeled on tab "ARB Adjustment."

(b) Please explain why the first ARB adjustment is made by subtracting the "Modeled ARBs" on tab "ARB Adjustment" from the "PJM Eligible Sales" on tab "VCEA RPS Goal (2023 Load)," while the second ARB adjustment is made by subtracting out the "Adjustment" on tab "ARB Adjustment" directly from the "RPS Requirement – Nuc Adjusted" on tabs "2023_B" and "2023_D."

(c) Should both ARB adjustments be made by subtracting the ARB quantity from RPS eligible load, rather than subtracting the ARB quantity directly from the Company's RPS requirement? If so, please provide updated calculations of the Company's RPS requirement in which the total ARB quantity is subtracted from RPS eligible load rather than the RPS requirement.

Response:

(a) The Company included the "Modeled ARBs" amount as an adjustment to RPS goal that was included in the PLEXOS model. The total number of ARBs to be accounted for in modeling was not finalized until after the base model runs were completed. The "New ARB amount" is the total amount of ARBs that the RPS goal should be adjusted for. The adjustment is the difference between what was modeled and the actual level of ARBs to be adjusted for.

(b) See the Company's response to subpart (a). The first ARB adjustment was adjusted in the modeling of the Alternative Plans. The second ARB adjustment was a topside adjustment to account for additional ARBs.

(c) Yes, the ARB topside adjustment should have been made by adjusting the eligible sales rather than subtracting directly from the RPS goal. The Company acknowledges that the RPS requirement was understated using the original methodology. See Attachment Sierra Club Set 08-01 for the updated RPS calculations.

This update to the RPS calculations impacts the "REC Purchases and Sales" and "REC Penalty Adjustment" topsides. The impact is immaterial to the overall plan NPVs. See below for plan impacts.

	NPV Impact (%)	NPV Impact ($B)
Plan A	1.10%	$1.20
Plan B	0.74%	$0.95
Plan C	0.73%	$0.93
Plan D	0.57%	$0.80
Plan E	0.57%	$0.79

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EXHIBIT DG-8

Company's Response to Sierra Club Discovery Request No. 3-4

Virginia Electric and Power Company
Case No. PUR-2023-00066
Sierra Club
Set 3

The following response to Question No. 4 of the Third Set of Interrogatories and Requests for Production of Documents propounded by the Sierra Club received on June 20, 2023, was prepared by or under the supervision of:

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

As it pertains to legal matters, following response to Question No. 4 of the Third Set of Interrogatories and Requests for Production of Documents propounded by the Sierra Club received on June 20, 2023, was prepared by or under the supervision of:

Vishwa B. Link
McGuireWoods LLP

Question No. 4

Please state whether the Company has evaluated the cost of complying with new proposed carbon pollution regulations[3].

(a) If yes, please provide all such analyses and explain how the Company believes the regulations will impact the optimal portfolio or the costs of its preferred portfolio.

(b) If no, please state whether the Company plans to issue any updates that evaluate the impact that these proposed rules would have on the optimal portfolio or the costs of its preferred portfolio.

3 *See New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generation Units; Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule,* 88 Fed. Reg. 33240 (Proposed May 23, 2023).

Response:

The Company objects to this request to the extent it would require original work. Further, the Company objects to this request to the extent it implies the Company needs to update its modeling. The 2023 Plan is based on a "snapshot in time" of current technologies, market information, projections, and laws and regulations. The regulation referenced in the request was issued as a proposed set of options for public comment. almost three weeks after the Company filed its 2023 Plan, and could substantially change when issued as a final rule expected next year.

Finally, the Company objects to this request as vague because the Company does not have "a preferred portfolio." Subject to and notwithstanding these objections, the Company provides the following response.

No, the Company has not evaluated the cost of complying with the referenced carbon pollution regulation.

(a) Not applicable.

(b) The Company has no plans to issue an update evaluating the impact of the proposed rule and there is no requirement for the Company to do so. Changes in regulations, when issued as final, will be modeled in future IRPs.

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EXHIBIT DG-9

Company's Response to Sierra Club Discovery Request No. 3-5

<u>Virginia Electric and Power Company</u>
<u>Case No. PUR-2023-00066</u>
<u>Sierra Club</u>
<u>Set 3</u>

As it pertains to carbon sequestration and storage, hydrogen conversion, and dual gas firing technologies, the following response to Question No. 5 of the Third Set of Interrogatories and Requests for Production of Documents propounded by the Sierra Club received on June 20, 2023, was prepared by or under the supervision of:

Kelsi C. Jewell
Business Development Manager
Dominion Energy Virginia

As it pertains to modeling, the following response to Question No. 5 of the Third Set of Interrogatories and Requests for Production of Documents propounded by the Sierra Club received on June 20, 2023, was prepared by or under the supervision of:

Jarad L. Morton
Manager – Integrated Strategic Planning
Dominion Energy Virginia

As it pertains to legal matters, the following response to Question No. 5 of the Third Set of Interrogatories and Requests for Production of Documents propounded by the Sierra Club received on June 20, 2023, was prepared by or under the supervision of:

Vishwa B. Link
McGuireWoods LLP

Question No. 5

Please state whether the Company has evaluated the cost of installing carbon sequestration and storage, hydrogen conversion, or dual gas firing conversion:

(a) at any of the Company's existing fossil plants, or

(b) at any new planned or proposed natural gas plants.

Response:

The Company objects to this request as vague because "dual gas firing conversion" is undefined. Subject to and notwithstanding this objection, the Company provides the following response.

The Company continuously evaluates technologies to determine the viability of carbon capture and sequestration at existing and new fossil plants; however, there are still critical constraints on storing captured carbon, which has limited the commercial viability. This is primarily based on limited knowledge of geologic formations, their capability to permanently store captured carbon, lack of proposed pipelines to take captured carbon from a plant to an approved storage location, or alternatives to utilize captured carbon. Given the lack of viability, the Company did not include costs for carbon capture and sequestration.

Regarding hydrogen, please refer to the Company's response to Clean Virginia Set 01-16.

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EXHIBIT DG-10

Company's Response to Commission Staff Discovery Request No. 1-23.

230810216

Virginia Electric and Power Company
Case No. PUR-2023-00066
Virginia State Corporation Commission Staff
Set 1

The following **revised** response (dated June 14, 2023) to Question No. 23 of the First Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on June 2, 2023, was prepared by or under the supervision of:

Kelsi C. Jewell
Business Development Manager
Dominion Energy Virginia

As it pertains to legal matters, the following response to Question No. 23 of the First Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on June 2, 2023, was prepared by or under the supervision of:

Vishwa B. Link
McGuireWoods LLP

Question No. 23

Is the Company currently pursuing the development of any gas-fired combustion turbine ("CT") units in Virginia, such as seeking air permits and/or local permits? If so, please identify the expected location(s) of these units and when the Company anticipates filing an application or applications with the Commission for certificates of public convenience and necessity for these CT units.

Response (dated June 14, 2023):

The Company objects to this request as not relevant or reasonably likely to lead to the production of admissible evidence in this proceeding as the IRP is not a request for a certificate of public convenience and necessity, nor a request for cost approval of any particular resource. Such documentation will be provided at the time the Company seeks such approvals. Subject to and notwithstanding this objection, the Company provides the following response.

This response is now public. No changes have been made to the substance of this response.

~~This response contains confidential information as indicated and is being provided pursuant to the protections set forth in 5 VAC 5-20-170, the Hearing Examiner's Protective Ruling and Additional Protective Treatment for Extraordinarily Sensitive Information dated May 23, 2023, any additional protective order or protective ruling that may be issued for confidential or~~

~~extraordinarily sensitive information in this proceeding, and the Agreements to Adhere executed pursuant to such orders or rulings.~~

See Section 5.4.2 of the 2023 Plan. The Company is currently evaluating and in the development phase of gas-fired combustion turbines. ~~[BEGIN CONFIDENTIAL INFORMATION]~~ The project is in Chesterfield County and the Company anticipates applying for an air permit and local permits in 2023. The Company anticipates filing for approval with the Commission in 2024 ~~[END CONFIDENTIAL INFORMATION]~~.

Virginia Electric and Power Company
Case No. PUR-2023-00066
Virginia State Corporation Commission Staff
Set 1

The following **revised** response (dated June 14, 2023) to Question No. 61 of the First Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on June 2, 2023, was prepared by or under the supervision of:

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

As it pertains to legal matters, the following response to Question No. 61 of the First Set of Interrogatories and Requests for Production of Documents propounded by Virginia State Corporation Commission Staff received on June 2, 2023, was prepared by or under the supervision of:

Vishwa B. Link
McGuireWoods LLP

Question No. 61

Please refer to Section 3.1 on page 37 of the IRP, specifically the statement, "Continue development work for 970 MW of new gas-fired CTs." Please provide a narrative explanation of what actions or communications the Company has undertaken or is currently undertaking to develop 970 MW of new gas-fired CTs. Please include the following information, at a minimum:

(a) The expected timeframe the Company plans to request approval of the 970 MW of additions;

(b) Nameplate capacity of each CT comprising the 970 MW of additions; and

(c) The location or locations the 970 MW of new gas-fired CTs are going to be installed, planned to be installed, or may be installed.

(d) The Company's rationale for developing the 970 Mw of gas-fired CTs (e.g., reliability concerns, additional capacity requirements, etc.).

Response (dated June 14, 2023):

The Company objects to this request as not relevant or reasonably likely to lead to the production of admissible evidence in this integrated resource plan proceeding as the Company is not seeking approval of any specific resource in this proceeding. Subject to and notwithstanding this objection, the Company provides the following response.

This response is now public. No changes have been made to the substance of this response.

~~This response contains confidential information as indicated and is being provided pursuant to the protections set forth in 5 VAC 5-20-170, the Hearing Examiner's Protective Ruling and Additional Protective Treatment for Extraordinarily Sensitive Information dated May 23, 2023, any additional protective order or ruling that may be issued for confidential or extraordinarily sensitive information in this proceeding, and the Agreements to Adhere executed pursuant to any such orders or rulings.~~

The development of the new gas-fired generation plant was paused several years ago due to the VCEA. Prior to pausing the development process, the Company acquired the real estate, held county meetings, conducted an open house within the community, and has had a publicly available website with initial project details. Due to the increased reliability risks noted in Section 5.4.2 of the 2023 Plan, the Company restarted the development of the project and is ~~**[BEGIN CONFIDENTIAL INFORMATION]**~~ actively working with the locality on future open houses and local permitting. The Company will proceed in seeking the local permitting in 2023 as well as submitting an air permit application in 2023. ~~**[END CONFIDENTIAL INFORMATION]**~~

(a) The Company plans to seek approval of additional gas fired CTs in ~~**[BEGIN CONFIDENTIAL INFORMATION]**~~ 2024. ~~**[END CONFIDENTIAL INFORMATION]**~~

(b) The Company has not yet contracted with a specific technology vendor.

(c) The Company is currently developing new gas fired CTs in ~~**[BEGIN CONFIDENTIAL INFORMATION]**~~ Chesterfield County in the James River Industrial Center. ~~**[END CONFIDENTIAL INFORMATION]**~~

(d) The Company needs dispatchable generation to reliably meet growing energy and capacity needs. See Sections 1.1, 1.3, 5.4.2, and 7.5 of the 2023 Plan.

CERTIFICATE OF SERVICE

In accordance with the Commission's April 1, 2020 Order Requiring Electronic Service in Case No. CLK-2020-0007, I certify that August 8, 2023, I sent the foregoing by electronic mail to:

Vishwa B. Link
Nicole M. Allaband
vlink@mcguirewoods.com
nallaband@mcguirewoods.com

Paul E. Pfeffer
Lisa R. Crabtree
paul.e.pfeffer@dominionenergy.com
lisa.r.crabtree@dominionenergy.com

Mark W. DeLaquil
Glenn S. Benson
mdelaquil@bakerlaw.com
gbenson@bakerlaw.com

William T. Reisinger
will@reisingergooch.com

C. Meade Browder Jr.
John E. Farmer
R. Scott Herbert
mbrowder@oag.state.va.us
jfarmer@oag.state.va.us
sherbert@oag.state.va.us

Nate Benforado
Will Cleveland
Josephus Allmond
Grayson Holmes
nbenforado@selcva.org
wcleveland@selcva.org
jallmond@selcva.org
gholmes@selcva.org

Kiva Bland Pierce
Arlen Bolstad
Kiva.Pierce@scc.virginia.gov
Arlen.Bolstad@scc.virginia.gov

Mary Lynne Grigg
Nicholas A. Dantonio
mgrigg@mcguirewoods.com
ndantonio@mcguirewoods.com

Jasdeep S. Khaira
Gregory D. Habeeb
habeeb@gentrylocke.com
khaira@gentrylocke.com

Eric M. Page
Cody T. Murphey
epage@eckertseamans.com
cmurphey@eckertseamans.com

Sheila Jane Weimer
sweimer@culpepercounty.gov

S. Perry Coburn
Timothy G. McCormick
Christian F. Tucker
pcoburn@cblaw.com
tmccormick@cblaw.com
ctucker@cblaw.com

Brian R. Greene
Eric W. Hurlocker
Eric J. Wallace
Victoria L. Howell
BGreene@GreeneHurlocker.com
EHurlocker@GreeneHurlocker.com
EWallace@GreeneHurlocker.com
VHowell@GreeneHurlocker.com

Evan Dimond Johns
(Virginia State Bar No. 89285)