

STATE CORPORATION COMMISSION
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Case No. PUR-2022-00124
Sponsor: ("ENVIRONMENTAL RESONDENT")
Exhibit No. 43

Witness: GREGORY L. ABBOTT
Bailiff: JABARI T. ROBINSON

2022140005

Summary of the Direct Testimony of Gregory L. Abbott

My testimony examines Dominion Energy Virginia's ("Dominion's") 2022 RPS filing. I provide an overview of the differences between an RPS Plan and an IRP Plan, including the unavoidable overlaps between the two. I highlight some of the major changes in forecasts between Dominion's 2021 IRP update filing that was the foundation of Dominion's 2021 RPS Plan and the 2022 IRP Update that forms the foundation for the development of Dominion's 2022 RPS Plan. I make certain recommendations to improve the accuracy of the modeling results. Further, I discuss the importance of identifying a least-cost plan for achieving the mandatory RPS Program ("RPS Program") requirements that can reduce the costs ultimately recovered from captive customers and I make recommendations towards that end. I also discuss the inherent risks contained in the RPS Development Plan including forecasting risk, performance risk and project development risk and offer a recommendation to minimize overall risk to customers.

I recommend that the most recent IRP Update be included as a support document to the initial application filed in future RPS Plan filings. The 2022 IRP Update is a foundational document that is one of the main pillars supporting the 2022 RPS Development Plan.

Any solar power purchase agreement ("PPA") that has a lower levelized cost of energy ("LCOE") than the LCOE of the least expensive proposed CE-3 utility scale solar projects will provide more value and fewer risks to customers. Should the Commission determine that the proposed utility-owned CE-3 utility scale projects are reasonable and prudent in this case, then logic would dictate that those solar PPAs that provide more value and fewer risks at a lower cost are also reasonable and prudent. I recommend that the Commission approve all such solar PPAs over and above the solar PPAs proposed by Dominion.

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1 **Q1. PLEASE STATE YOUR NAME AND ADDRESS AND YOUR ROLE WITH THE**
2 **ENVIRONMENTAL RESPONDENT.**

3 **A1.** My name is Gregory Abbott, and my address is 8610 Sunview Lane, North Chesterfield,
4 VA. My expert testimony in this proceeding is on behalf of Appalachian Voices
5 ("Environmental Respondent").

6 **Q2. PLEASE SUMMARIZE YOUR EXPERIENCE IN ELECTRIC UTILITY**
7 **REGULATION IN VIRGINIA.**

8 **A2.** I was previously employed as a member of the Virginia State Corporation Commission
9 ("Commission") Staff and retired earlier this year as a Deputy Director after 24 years of
10 service in the Commission's Division of Public Utility Regulation. I have widespread
11 experience in the regulation of electric, gas, water and sewer utilities located in the
12 Commonwealth. This experience ranges from general rate increase applications, class cost
13 of service, rate design, Integrated Resource Plans ("IRPs"), generation certificates,
14 Renewable Portfolio Standard ("RPS") cases, coal ash disposal, rate adjustment clauses
15 ("RACs"), Demand-Side Management, PJM matters, weather normalization adjustments,
16 CARE plans, and pole attachments.

17 Further, I have extensive experience in reviewing Dominion Energy Virginia
18 ("Dominion") generation planning for IRPs, certificates of public convenience and
19 necessity for both fossil fuel and renewable generation facilities, and RPS filings. I
20 previously filed testimony on behalf of the Commission's Staff in Dominion's 2013 IRP,
21 2015 IRP, 2016 IRP, 2017 IRP, 2018 IRP, 2020 IRP, and the 2020 RPS Plan filing. I have
22 testified before the Commission in scores of cases, and a representative list of cases is
23 provided in Attachment GLA-1.

1 **Q3. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

2 **A3.** My testimony examines Dominion's 2022 RPS filing. I provide an overview of the
3 differences between a RPS Plan and an IRP Plan including the unavoidable overlaps
4 between the two. I highlight some of the major changes in forecasts between Dominion's
5 2021 IRP update filing that was the foundation of Dominion's 2021 RPS Plan¹ and the
6 2022 IRP Update that forms the foundation for the development of Dominion's 2022 RPS
7 Plan. I make certain recommendations to improve the accuracy of the modeling results.
8 Further, I discuss the importance of identifying a least-cost plan for achieving the
9 mandatory RPS Program ("RPS Program") requirements that can reduce the costs
10 ultimately recovered from captive customers and I make recommendations towards that
11 end. I also discuss the inherent risks contained in the RPS Development Plan including
12 forecasting risk, performance risk and project development risk and offer a
13 recommendation to minimize overall risks to customers. Given the unavoidable overlap
14 between the IRP planning process and the development of this RPS Plan, some of my
15 recommendations may be more applicable to future IRP filings and I attempt to identify
16 such instances.

17 This RPS filing is voluminous and covers a lot of ground. To the extent that my
18 testimony is silent on a given issue or project, such silence should not be construed to mean
19 that I necessarily support or oppose Dominion's position on those issues or projects.

¹ Dominion refers to this as the RPS Development Plan. In my testimony the terms "RPS Plan" and "RPS Development Plan" are synonymous.

2021-07-16

OVERVIEW

Q4. PLEASE IDENTIFY THE POLICY GOALS CONTAINED IN THE 2020 VIRGINIA CLEAN ECONOMY ACT ("VCEA").

A4. It is clear that the main policy goal of the VCEA is to move the Commonwealth to a zero-carbon energy future. This is accomplished by establishing a mandatory RPS Program in § 56-585.5 C of the Code of Virginia ("Code") that requires Dominion to meet a RPS Program requirement for zero carbon energy sales that begins at 14% of energy sales in 2021 and reaches 100% of energy sales by 2045. Further, § 56-585.5 D of the Code requires Dominion to petition the Commission for approval to construct, acquire, or enter into purchase agreements for 16,100 MWs of generating capacity from solar and onshore wind resources located in the Commonwealth. In addition, pursuant to § 56-585.5 D and § 56-585.1:11 of the Code, Dominion is required to petition the Commission for approval to construct or purchase one or more offshore wind facilities with an aggregate capacity up to 5,200 MWs. Further, the VCEA and the Clean Energy and Community Flood Preparedness Act of 2020 ("CECFPA") required Virginia's participation in the Regional Greenhouse Gas Initiative ("RGGI"). The primary purpose of RGGI is to provide a price signal to reduce the dispatch of fossil fuel units to reduce carbon output. Thus, it is clear that the VCEA and the CECFPA set Virginia on the path to achieve the public policy goal of 100% carbon-free energy.

Q5. DOES ENVIRONMENTAL RESPONDENT SUPPORT THE POLICY GOALS CONTAINED IN THE VCEA?

A5. Yes. The Environmental Respondent supports the public policy goal of achieving 100% carbon-free energy in Virginia. However, the Environmental Respondent believes that this

should be achieved in a least-cost manner while also maintaining system reliability. Therefore, it is imperative that Dominion perform credible least-cost planning that also complies with all relevant laws and regulations.

As noted earlier, § 56-585.5 D of the Code requires Dominion to *petition* the Commission for approval to construct, acquire, or enter into purchase agreements for 16,100 MWs of generating capacity from solar and onshore wind resources located in the Commonwealth by 2035 with interim goals in 2024, 2027, and 2030. However, Environmental Respondent has consistently argued that the Commission is not obligated to approve every project included in these petitions if such projects are found not to be reasonable and prudent.² Environmental Respondent generally supports the goals for solar and onshore wind resources enumerated in § 56-585.5 D. However, that support extends only to those § 56-585.5 D resources that are necessary to fulfill the § 56-585.5 C RPS Program requirements and to serve native load at least-cost and minimum risk.

COMPARISON OF RPS PLANNING AND IRP PLANNING

Q6. PLEASE COMPARE AND CONTRAST RPS PLANS WITH IRP FILINGS.

A6. Dominion is required to file formal IRPs every three years in the year prior to filing its Triennial Reviews.³ In contrast, Dominion is required to file an annual RPS Plan pursuant to § 56-585.5 D 4 which states:

In connection with the requirements of this subsection, each Phase I and Phase II Utility shall, commencing in 2020 and concluding in 2035, submit annually a *plan* and petition for approval for the development of new solar and onshore wind generation capacity. Such

² See, e.g., Environmental Respondent's Post-Hearing Brief, *Petition of Virginia Electric and Power Company for approval of its 2021 RPS Development Plan under § 56-585.5 D 4 of the Code of Virginia*, PUR-2021-00146 (Jan. 19, 2022) at 17; Environmental Respondent's Statement of Issues and Post-Hearing Brief, *Ex Parte: Establishing 2020 RPS Proceeding for Virginia Electric and Power Company*, PUR-2020-00134 (Mar. 23, 2021) at 2, 8.

³ In addition to these triennial formal IRP filings, Dominion also files an annual IRP Update to reflect any major changes that may have occurred since the last formal IRP filing.

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1 *plan* shall reflect, in the aggregate and over its duration, the
2 requirements of subsection D concerning the allocation percentages
3 for construction or purchase of such capacity. [emphasis added]

4 In addition to filing a *plan*, § 56-585.5 D 4 also requires that Dominion file a
5 *petition* for approval of § 56-585.5 D solar and onshore wind resources in accordance with
6 the goals reflected in § 56-585.5 D. This is very different than a formal IRP which is a
7 planning document only.

8 Another difference between a RPS Plan and a formal IRP is the scope of the
9 planning process. IRPs are much broader in scope and typically consider more issues and
10 solutions than just satisfying the RPS Program requirements. For example, an IRP may
11 consider fuel diversity, development risks, system reliability, and non-structural solutions
12 such as energy efficiency and alternative rate designs to name a few. Of course, developing
13 one or more plans that satisfy the § 56-585.5 C RPS Program requirements using § 56-
14 585.5 D solar and onshore wind resources and § 56-585.1:11 offshore wind resources will
15 be an integral component of IRPs on a going forward basis. As such, the RPS Plan
16 submitted in this case is a subset of, and consistent with, its most recent IRP Update.

17 Given the aggressive RPS Program requirements contained in § 56-585.5 C and the
18 expansive solar and onshore wind resource goals contained in § 56-585.5 D, submitting
19 the annual RPS Plans and petitions for approval of solar and wind resources is difficult and
20 challenging. Further, given the annual frequency of the RPS Plan filings and the amount
21 of work required to bring next year's filing to fruition, Dominion is already well underway
22 in developing next year's filing, which makes it difficult to implement changes to the
23 process or fully consider issues that may be raised in the current case. On the other hand,
24 the triennial filing cycle for formal IRP filings allows Dominion more time to consider

1 issues that may be raised, make model improvements, engage in research, form working
2 groups to discuss and resolve issues, etc. before the next formal IRP filing.

3 **Q7. PLEASE DISCUSS THE AREAS OF OVERLAP BETWEEN RPS PLANS AND IRP**
4 **FILINGS.**

5 **A7.** The RPS Plan is a subset of, and consistent with, Dominion's most recent IRP Update.
6 Dominion is required to file a formal IRP every three years. In the intervening years,
7 Dominion is expected to file an IRP Update to reflect any major changes that may have
8 occurred. Dominion has historically filed IRP Updates in all intervening years regardless
9 of whether any major changes have occurred or not. At a minimum, Dominion updates its
10 peak load and energy sales forecasts and commodity price forecasts and re-runs the
11 PLEXOS model to arrive at updated net present value ("NPV") costs for the various plans
12 in the IRP Updates. Thus, both the RPS Plan and IRP use the PLEXOS model and rely on
13 the same peak load and energy sales forecasts and commodity price forecasts. Further, all
14 other model assumptions and constraints are the same.

15 Importantly, these IRP Updates are informal and for informational purposes only.
16 IRP Updates are not litigated proceedings and neither Staff nor other interested parties have
17 an opportunity to conduct discovery, challenge model assumptions or model results.
18 Therefore, notwithstanding objections from Dominion, this current 2022 RPS
19 Development Plan case is the only proceeding available for Staff and respondents to
20 examine the input data and model assumptions that were used in the 2022 IRP Update and
21 that were used in conducting the economic analysis for the CE-3 projects and CE-3 PPAs.⁴

⁴ Power Purchase Agreements ("PPAs").

1 Q8. CAN YOU PROVIDE AN EXAMPLE OF DOMINION'S OBJECTIONS TO
2 PROVIDING INFORMATION AND DATA FROM THE 2022 IRP UPDATE?

3 A8. Yes. Given that the RPS Plan results are predicated on the 2022 IRP Update, both Staff
4 and Environmental Respondent have sought information on the 2022 IRP through
5 discovery. Dominion states the following objection⁵ to any interrogatories concerning the
6 2022 IRP Update.

7 The Company objects to this request as not relevant or reasonably calculated
8 to lead to the discovery of admissible evidence in this proceeding, as it seeks
9 information on a separate proceeding with separate requirements that does
10 not have a discovery process and that has been dismissed by the
11 Commission by Final Order dated October 31, 2022. Notwithstanding and
12 subject to this objection, the Company provides the following response.

13 In my opinion, Dominion's resistance to answering questions about the 2022 IRP
14 Update prevents the scope of this RPS proceeding from expanding into an IRP level
15 investigation. It is apparent that Dominion prefers to keep the scope of this proceeding
16 narrow and mainly focused on the CE-3 projects and CE-3 PPAs. Given the costs involved,
17 it is important that Staff and other Respondents be able to examine the model assumptions
18 and model inputs to determine if the economic analysis supporting the CE-3 projects and
19 CE-3 PPAs is reasonable. To the extent that Staff or Respondents identify areas of
20 improvement in the model assumptions and inputs or identify new scenarios to be modeled,
21 in my opinion, such adjustments and recommendations should be performed in Dominion's
22 next IRP or IRP Update and RPS Plan filing to the extent that the Commission agrees with
23 any such adjustments and recommendations.

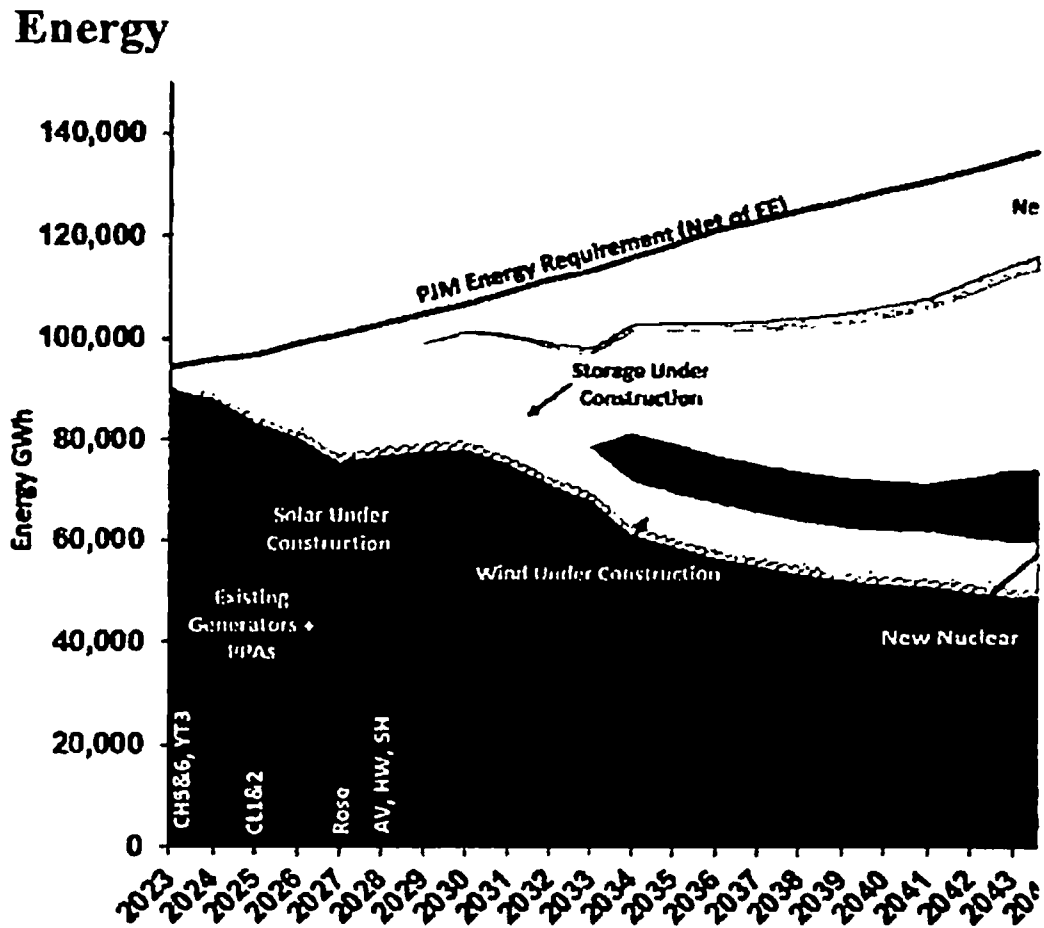
⁵ The example shown specifically comes from the Dominion's Response to Staff Set 3-79.

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1 **Q9. DO YOU HAVE ANY RECOMMENDATIONS REGARDING IRP UPDATES?**

2 **A9.** Yes. I recommend that the most recent IRP Update be included as a support document filed
3 in future RPS Plan filings. The 2022 IRP Update is a foundational document that is one of
4 the main pillars supporting the 2022 RPS Development Plan. Further, there are a number
5 of major changes that have occurred from the 2021 IRP Update to the 2022 IRP Update
6 that have a direct impact on the analysis performed for the 2022 RPS Plan. Although
7 Respondents and the general public can access the 2022 IRP Update document from the
8 Commission's on-line case information system, the document is in black and white and of
9 poor quality. For example, charts that contain color graphics are of a particularly poor
10 quality and almost impossible to decipher, such as the chart below that depicts the energy
11 position over the planning period for Plan B.⁶

⁶ *In re: Virginia Electric and Power Company's 2022 Update to its Integrated Resource Plan pursuant to Va. Code § 56-597 et seq.*, Case No. PUR-2022-00147 (Sept. 1, 2022) at Appendix 2A.



1 Requiring a color pdf of IRP Updates be included as a support document for future
 2 RPS Development Plan cases will reduce the amount of discovery required in future cases
 3 and thus be more efficient.

4 **Q10. PLEASE ELABORATE ON THE MAJOR CHANGES THAT HAVE OCCURRED**
 5 **FROM THE 2021 IRP UPDATE TO THE 2022 IRP UPDATE?**

6 **A10.** There have been several major macro changes that have impacted the peak load forecast,
 7 the energy sales forecast, and the commodity price forecasts. Recent geopolitical pressures
 8 have roiled global energy markets which has had an acute impact on natural gas prices and

the level of volatility in those markets.⁷ In addition, PJM has significantly increased both its Dom-Zone peak load forecast and its Dom-Zone energy sales forecast compared to its 2021 forecast. Further, on September 2, 2021, FERC issued an Order that removed the expanded Minimum Offer Price Rule (“MOPR”) and also approved a rule change for the Market Seller Offer Cap (“MSOC”) both of which have an impact on the PJM capacity price market.

Q11. DO YOU HAVE ANY COMMENTS ON THE REVISED PEAK LOAD, ENERGY SALES, AND COMMODITY PRICE FORECASTS CONTAINED IN THE 2022 IRP UPDATE USED TO SUPPORT THE ECONOMIC ANALYSIS FOR THE CE-3 PROJECTS AND CE-3 PPAS?

A11. Yes. First, I appreciate that Dominion has refreshed its forecasts in the 2022 IRP Update rather than rely on stale data. I do have some concerns, however, with some of the revised forecasts. My primary concerns are with Dominion's revised peak load forecast, energy sales forecast, and capacity price forecast.

Q12. WHAT ARE YOUR CONCERNS WITH THE PEAK LOAD AND ENERGY SALES FORECASTS PRESENTED IN THE 2022 IRP UPDATE?

A12. The Commission rejected Dominion’s internal peak load and energy sales forecasts in its December 7, 2018 Order (“2018 IRP Order”). Further, the Commission directed Dominion to use the PJM forecast instead. On pages 7 and 8, the 2018 IRP Order stated the following:

The Commission recognizes that every forecast has strengths and weaknesses and that no forecast will exactly match actual results except by chance; however, weighing the evidence presented in this proceeding, the Commission has considerable doubt regarding the accuracy and reasonableness of the Company's load forecast for use to predict future energy and peak load requirements. In reaching this

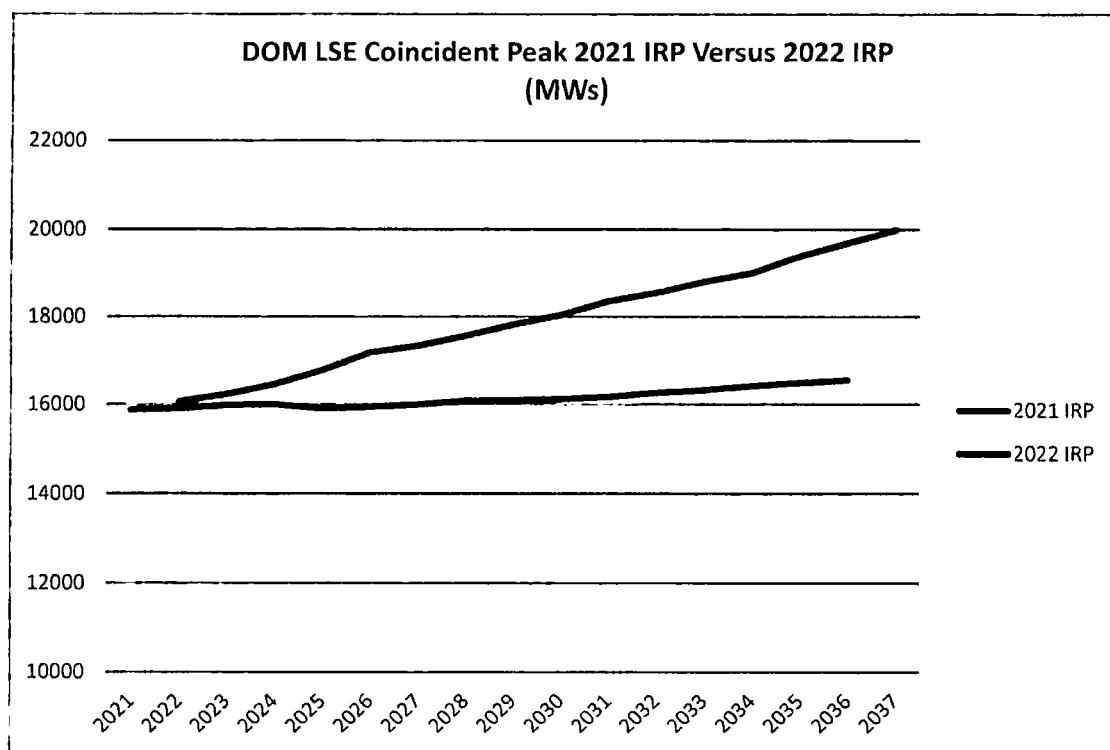
⁷ These global market events impacted US gas prices initially but have also more recently caused increases in observed US coal prices.

1 conclusion, the Commission has considered all evidence presented
2 in this proceeding including the alternative forecasts presented, as
3 well as trends in the Company's historical load forecasts.

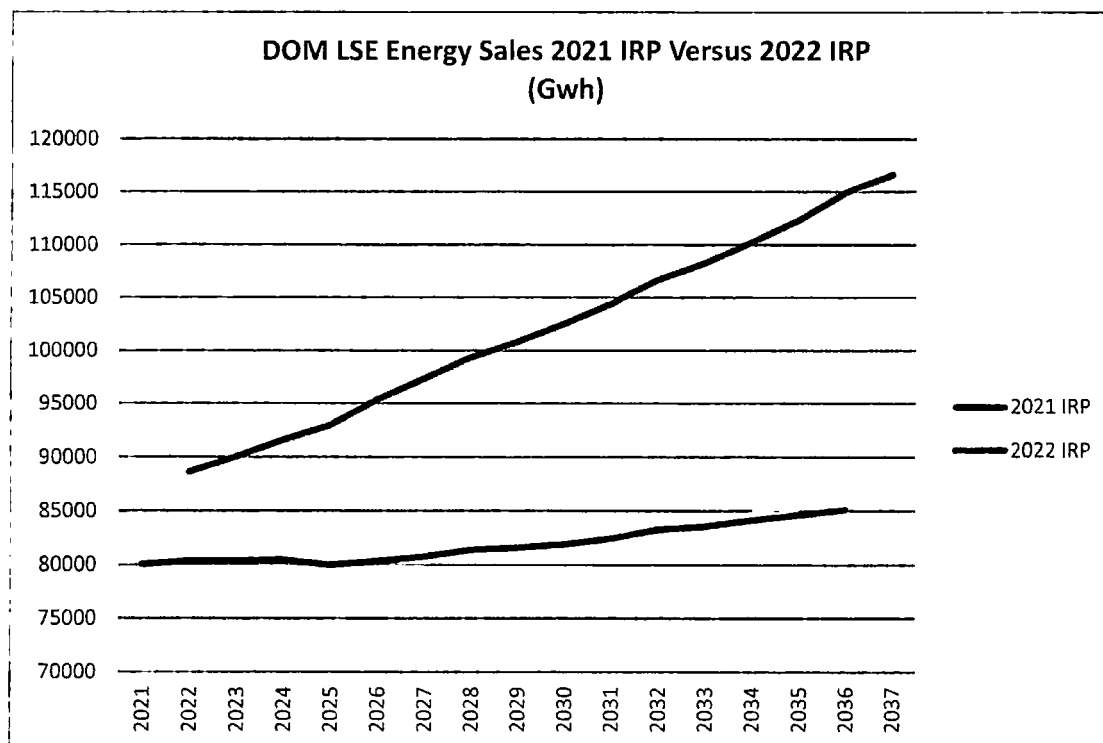
4 Based on the foregoing, rather than the Company's internal load
5 forecast, the Commission directs that, for purposes of its corrected
6 2018 IRP, the Company shall utilize the Dominion Zone PJM
7 coincident peak load forecast and energy sales forecast, scaled down
8 to the Dominion load serving entity level, consistent with the
9 methodology presented by Staff witness White, as further modified
10 below.⁸

11 Dominion has followed this directive from the Commission in all subsequent IRPs
12 filed with the Commission including the 2022 IRP Update. However, the drastic change in
13 both the peak load forecast and the energy sales forecast presented in the 2022 IRP Update
14 compared to the 2021 IRP Update is concerning and potentially raises questions about the
15 efficacy of the PJM forecasts. At a minimum, a high level of volatility in peak load and
16 energy sales forecasts from one year to the next introduces a risk vector in RPS
17 Development Plans that can result in captive customers being burdened with excess costs.
18 I will discuss this forecast risk and a potential remedy to address this risk later in my
19 testimony. Comparisons of the peak load forecast and energy sales forecast for the 2021
20 IRP Update and the 2022 IRP Update are presented in the charts below.

⁸ Order, *In re: Virginia Electric and Power Company's Integrated Resource Plan* filing pursuant to Va. Code § 56-597 et seq., Case No. PUR-2018-00065 (Dec. 7, 2018) at 7-8 (internal footnotes omitted).



- 1 The 2022 IRP Update forecasts the Dom LSE coincident peak load in 2036 to be
- 2 3,128 MWs, or about 19%, higher than the 2021 IRP Update forecast for 2036.



1 The 2022 IRP Update forecasts Dom LSE energy sales in 2036 to be 29,863 GWhs,
 2 or about 35%, higher than the 2021 IRP Update forecast for 2036. This large increase in
 3 the energy sales forecast is especially concerning since the quantity of future Renewable
 4 Energy Certificates ("RECs") required to meet the RPS Program goals is directly tied to
 5 the energy sales forecast.

6 **Q13. WHAT IS THE EXPLANATION FOR THIS LARGE INCREASE IN THE PEAK**
 7 **LOAD AND ENERGY SALES FORECASTS?**

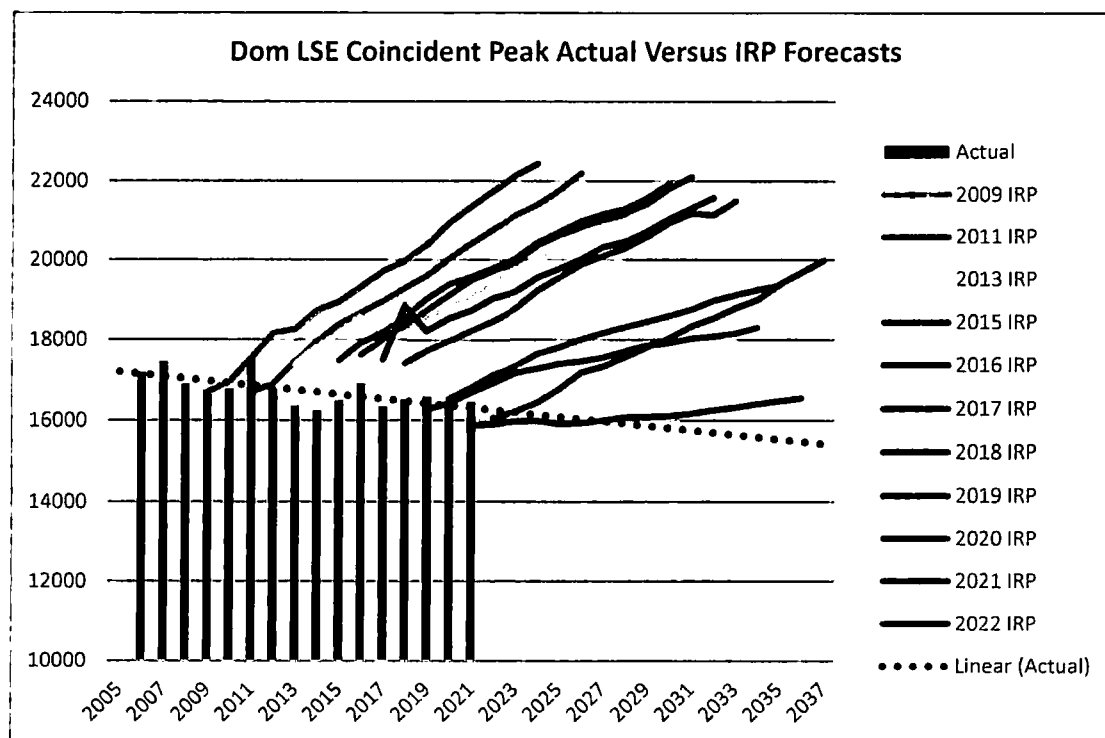
8 **A13.** An explanation is provided on page 5 of the 2022 IRP Update which states: "In its 2022
 9 Load Forecast, PJM incorporated changes to its load forecasting methodology and utilized
 10 the latest data center forecast provided by the Company and Northern Virginia Electric
 11 Cooperative, which resulted in a significant increase in the load forecast compared to
 12 2021."

13 Given that the Commission previously rejected Dominion's internal peak load and
 14 energy sales forecasts in the Commission's 2018 IRP Order, it is troubling that PJM has
 15 incorporated a large element of Dominion's internal forecast into the PJM forecast for the
 16 Dom-Zone.⁹

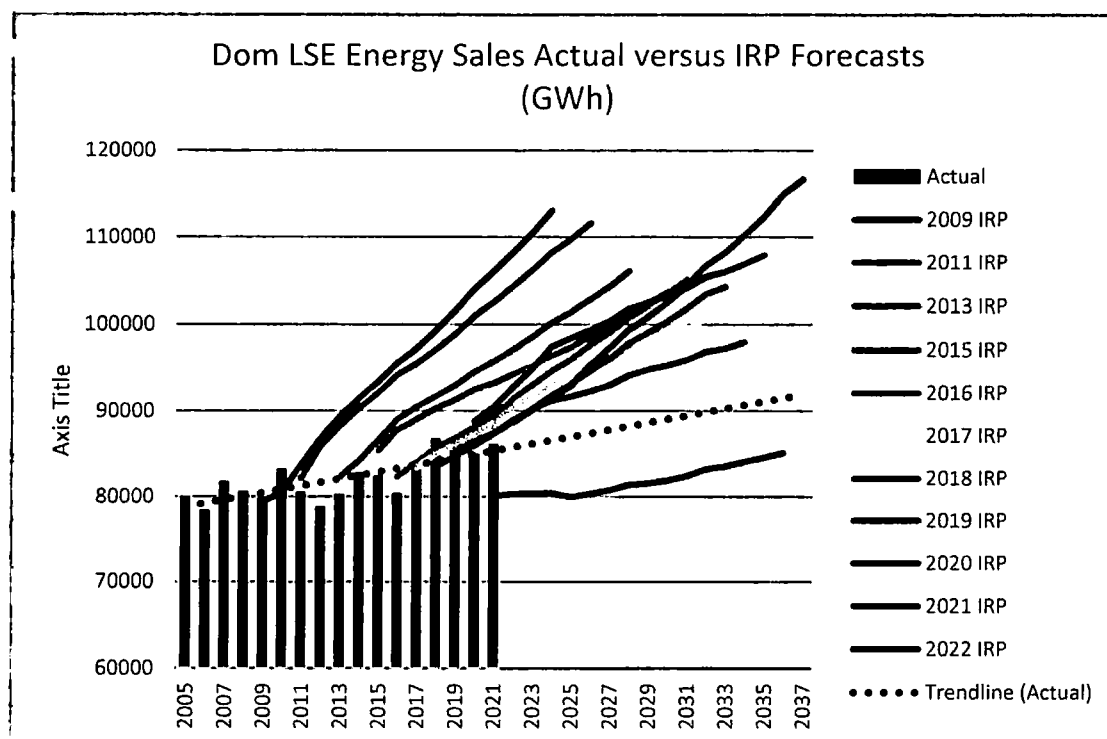
17 The true test of any forecast is how well it has performed in the past in predicting
 18 future values. If the PJM forecast were to begin to exhibit a track record of similar
 19 inaccurate results as Dominion's internal forecast, then the Commission may want to
 20 consider if the PJM forecast is appropriate to use going forward. The actual historic values

⁹ Environmental Respondent previously warned the Commission about the undue influence Dominion can have on the PJM forecast in the 2020 IRP. See Ex. 35, Direct Testimony of James R. Wilson, *In re: Virginia Electric and Power Company's Integrated Resource Plan* filing pursuant to Va. Code § 56-597 et seq., Case No. PUR-2020-00035 (Sept. 15, 2020) at 21.

1 compared to prior IRP forecasts for peak load and energy sales are presented in the charts
 2 below.



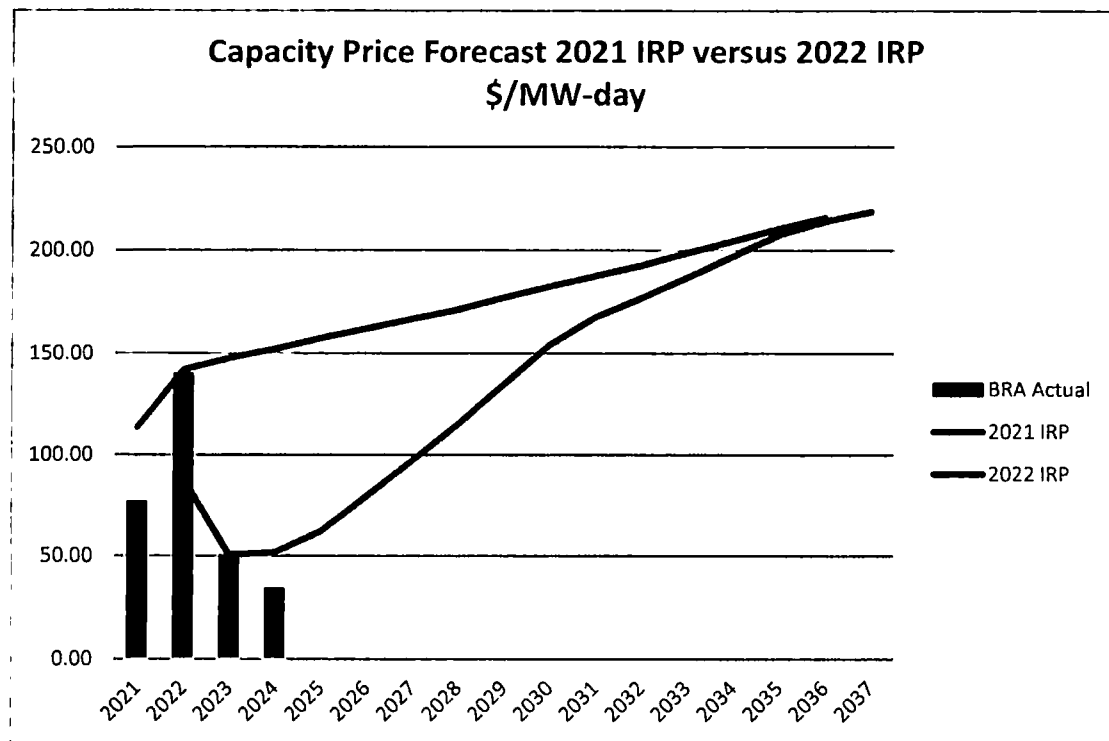
3 In the 2009 IRP, for the year 2021, Dominion forecast coincident peak load for the
 4 Dom LSE to be 4,887 MWs, or about 30%, higher than the actual 2021 Dom LSE
 5 coincident peak load. The historic trendline for this period has a negative slope. Although
 6 all forecasts have some level of inaccuracy, all of the internal Dominion forecasts depicted
 7 above for all IRPs up to and including the 2018 IRP exhibit a bias to the upside. The 2022
 8 IRP Update peak load forecast, which reflects the PJM forecast, has a similar growth
 9 trajectory as Dominion's internal forecasts from prior IRPs.



In the 2009 IRP, for the year 2021, Dominion forecast energy sales for the Dom LSE to be 19,939 GWhs, or about 23%, higher than the actual 2021 Dom LSE energy sales. The historic trendline for this period has a modestly positive slope. All of the internal Dominion forecasts depicted above for all IRPs up to and including the 2018 IRP exhibit a bias to the upside. The 2022 IRP Update energy sales forecast which reflects the PJM forecast has a similar growth trajectory as Dominion's internal forecasts from prior IRPs.

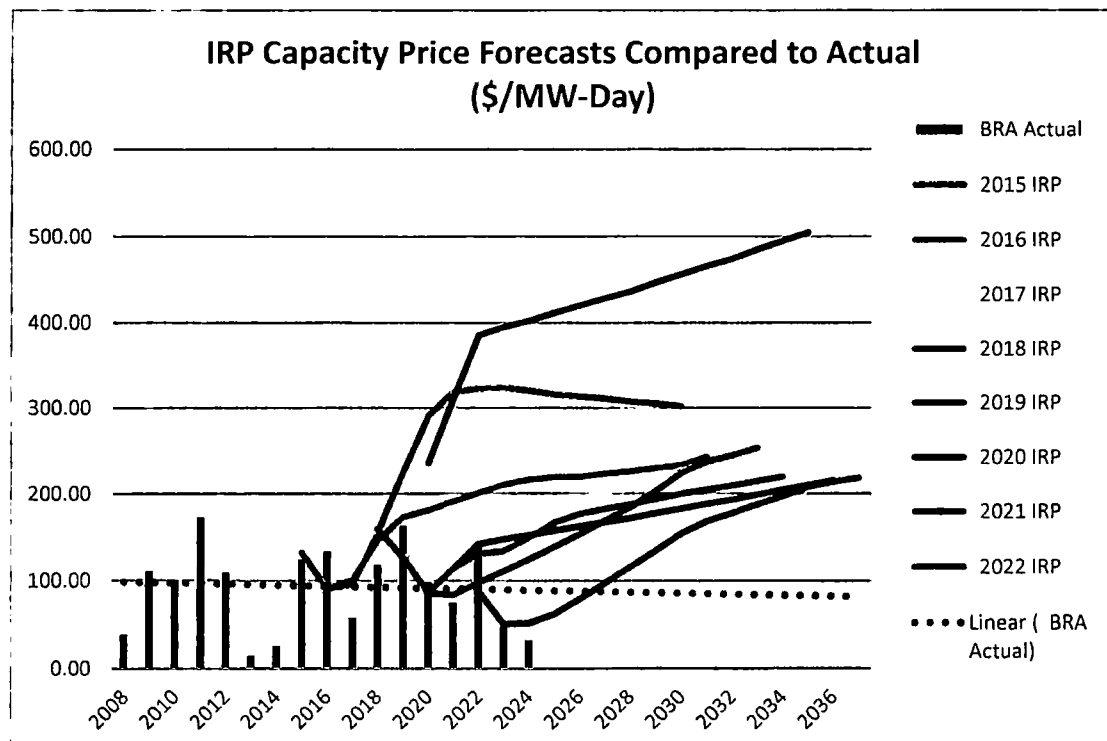
Q14. WHAT ARE YOUR CONCERNS WITH THE REVISED CAPACITY PRICE FORECAST PRESENTED IN THE 2022 IRP UPDATE?

A14. The capacity price forecast presented in the 2022 IRP Update is also substantially different from the capacity price forecast presented in the 2021 IRP Update. A comparison of the 2022 IRP Update capacity price forecast with the 2021 IRP Update capacity price forecast is shown in the chart below.



1 Dominion's consultant ICF completed the capacity price forecast used in the 2022
2 IRP Update on March 14, 2022. Thus, this forecast should reflect the September 2, 2021
3 FERC Order that removed the expanded MOPR and approved a rule change for the MSOC.
4 Although the capacity price forecast is lower in the early years, it has a higher annual
5 growth rate and eventually arrives at roughly the same forecasted capacity price by 2035.

6 My concern with the 2022 IRP Update capacity price forecast is whether it
7 accurately captures the effects of the rule change for the MSOC. I believe it is useful to
8 examine Dominion's track record for forecasting PJM capacity prices from prior IRPs with
9 actual results in this regard. A comparison of prior IRP forecasts with actual PJM base
10 residual auction ("BRA") capacity prices is shown in the chart below.



Again, Dominion's capacity price forecasts appear to have a bias to the upside. In contrast, the historic trendline for this period has a slightly negative slope. The capacity price forecast directly impacts the economic analysis performed for RPS projects and RPS PPAs as well as the NPV cost for the RPS Development Plan.

Q15. ARE YOU AWARE OF ANY OTHER INDEPENDENT FORECASTS OF PJM CAPACITY PRICES?

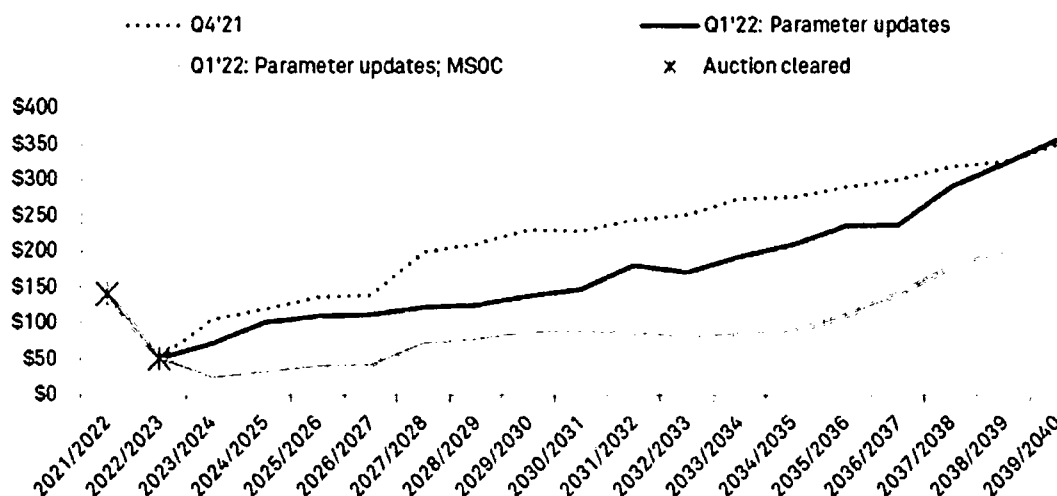
A15. Yes. S&P Global Market Intelligence ("S&P Global") recently published its forecast of PJM capacity prices.¹⁰ S&P Global's most recent forecast of future PJM capacity prices is significantly lower than the Dominion 2022 IRP Update forecast. A key observation from the S&P Global report:

¹⁰ Katherine McCaffrey, *PJM capacity prices projected to drop due to auction parameter, market updates*, S&P Global Market Intelligence (May 10, 2022), <https://www.spglobal.com/marketintelligence/en/news-insights/research/pjm-capacity-prices-projected-to-drop-due-to-auction-parameter-market-updates>.

Ahead of the 2023-24 Base Residual Auction taking place in June, PJM published its updated load forecast and auction parameters, including the final rates for implementation of the impactful Market Seller Offer Cap. Lower peak demand, installed reserve margin requirement and forced outage rates, offset by a higher net cost of new entry, lowered forecast prices marginally, while the market seller offer cap significantly limits the bid potential for generators, resulting in 62%-77% lower forecast capacity prices in the next 10 years compared to previous forecasts.

The chart below is reproduced from the S&P Global report.

PJM RTO capacity price forecasts (\$/MW-day) for Q4'21 and Q1'22 with varying assumptions



Dominion's 2022 IRP Update forecast of capacity prices is generally consistent with the S&P Global forecast that reflects PJM's updated load forecast and auction parameters but does not reflect the MSOC (blue line). The S&P Global forecast that reflects the impact of the MSOC is much lower (gold line). It should be noted that the S&P Global forecast that reflects the impact of the MSOC accurately predicted the capacity price decrease result of the BRA price for capacity for the 2023/2024 delivery year. Thus, Dominion's capacity price forecast appears to be too high. Given the date that the 2022 IRP Update forecast was completed, ICF may not have had time to fully reflect the impact of the MSOC in the forecast.

1 **Q16. BASED ON THE CONCERNS YOU RAISE WITH THE PEAK LOAD, ENERGY**
2 **SALES, AND CAPACITY PRICE FORECASTS, DO YOU HAVE ANY**
3 **COMMENTS ON APPROVAL OF THE RPS DEVELOPMENT PLAN OR CE-3**
4 **PROJECTS AND CE-3 PPAS?**

5 **A16.** The concerns I identified would certainly have an impact on the economic analysis for the
6 proposed CE-3 Projects and CE-3 PPAs. However, I am not advocating revising the
7 economic analysis performed for the CE-3 projects or CE-3 PPAs in this case. Likewise, I
8 am not advocating that the Commission reject the CE-3 Projects or CE-3 PPAs based on
9 these concerns. My primary objective in raising these concerns is to ensure that the
10 planning process, and economic analysis, in future IRP filings and future RPS filings is as
11 accurate as possible.

12 My concerns do draw into question the reasonableness of the RPS Development
13 Plan presented in this case. Whether or not the Commission approves the RPS
14 Development Plan for purposes of this case is distinct from whether the Commission
15 approves the individual projects, and I believe future RPS Development Plans submitted
16 in future annual RPS filings can be modified based on more accurate modeling in those
17 cases. Given the uncertainty and volatility in the energy sales forecast in particular, I
18 believe it is imperative to develop a strategy to mitigate the forecast risk on future build
19 plans contained in future RPS Development Plans.

PEAK LOAD AND ENERGY SALES FORECASTING RISK

Q17. PLEASE DESCRIBE THE RISKS TO CUSTOMERS FROM UNCERTAIN AND VOLATILE PEAK LOAD AND ENERGY SALES FORECASTS.

A17. As I mentioned earlier, the 2022 IRP Update forecasts the Dom LSE coincident peak load in 2036 to be 3,128 MWs, or about 19%, higher than the 2021 IRP Update forecast for 2036. To put this in perspective, this is roughly equivalent to the capacity for Dominion's Greensville and Brunswick power stations combined. Further, assuming a peak load capacity factor of 22% for solar tracking resources¹¹, an additional 14,218 MWs of solar facilities would be required to satisfy this additional coincident peak demand in 2036. If Dominion embarks on a build plan to meet this increased forecasted peak load and it turns out that actual peak loads come in much lower than predicted, then captive customers would be required to pay for resources that are not needed.

Furthermore, as mentioned earlier, the 2022 IRP Update forecasts Dom LSE energy sales in 2036 to be 29,863 GWhs, or about 35%, higher than the 2021 IRP Update forecast for 2036. Prior to the passage of the VCEA and the need for RECs to meet the RPS Program requirements, generation planning was generally driven by the need to meet PJM coincident peak load requirements. Meeting energy sales requirements through Company-owned generation had less of an impact on the build plans since Dominion has the ability to purchase and sell energy into the PJM energy markets in any given hour subject to import/export transmission constraints. The number of future RECs necessary to meet RPS Program requirements, however, is directly related to the forecast of energy sales. Therefore, the energy sales forecast may become the main driver of the future build plan

¹¹ December 2021 Effective Load Carrying Capability ("ELCC") Report, PJM (Dec. 31, 2021), <https://www.pjm.com/-/media/planning/res-adeq/elcc/elcc-report-december-2021.ashx>.

1 supplanting peak load considerations. Again, building a fleet of Company-owned resources
2 to meet a future energy sales forecast that may turn out to be illusory could cause captive
3 customers to pay for resources that are not needed.

4 **Q18. CAN YOU RECOMMEND A STRATEGY TO ADDRESS THE RISKS POSED TO**
5 **CAPTIVE CUSTOMERS FROM UNCERTAINTY IN THE PEAK LOAD AND**
6 **ENERGY SALES FORECASTS?**

7 **A18.** Yes. Rather than engaging in an argument over whether the 2021 IRP Update forecasts or
8 the 2022 IRP Update forecasts are more accurate, I believe that we should acknowledge
9 that the real issue is the risk to captive customers that is presented instead. I don't know
10 today whether the 2021 forecast will turn out to be more accurate than the 2022 forecast,
11 but I do know today that there is volatility between the forecasts, and that volatility imposes
12 its own risk on ratepayers. Given the volatility and level of uncertainty in the forecasts, it
13 would be better to develop a plan that fulfills the § 56-585.5 C RPS Program requirements
14 and serves native load that relies more heavily on solar PPAs rather than Company-owned
15 solar resources. Dominion currently requires that all solar PPAs have a purchase option
16 that provides a significant level of flexibility in meeting future needs in a least-cost manner
17 for captive customers. If actual Dom LSE coincident peak load and energy sales follow the
18 forecasted path contained in the 2022 IRP Update, then Dominion could exercise the
19 purchase options on one or more of these solar PPAs at the appropriate time to lock in the
20 remaining service life of the facilities. On the other hand, if actual Dom LSE coincident
21 peak load and energy sales follow the lower growth path contained in the 2021 IRP Update,
22 Dominion can allow the solar PPAs to expire if they are not needed, and ratepayers would
23 not be burdened with the costs of Company-owned resources that are unnecessary.

1 **Q19. ARE THERE ANY IMPLICATIONS FROM THE 2022 IRP UPDATE PEAK LOAD**
2 **AND ENERGY SALES FORECASTS BEING DRIVEN BY DOMINION'S**
3 **INTERNAL DATA CENTER FORECAST?**

4 **A19.** Yes. As I mentioned earlier, PJM incorporated Dominion's internal data center peak load
5 and energy sales forecast into PJM's 2022 load forecast. Dominion's 5-Year Data Center
6 Plan is shown in Attachment GLA-2.¹² Dominion's 5-year forecast shows the peak load
7 from data centers to grow to 5,153 MWs by 2026 or about 3,345 MWs higher than actual
8 data center peak load of 1,808 MWs in 2020. Although the energy sales load is not shown
9 in the 5-year forecast, data centers are high load factor customers. Thus, essentially all of
10 the projected growth in peak load and energy sales through 2035 is driven by data center
11 growth.

12 The technology companies that own these data centers may also have zero-carbon
13 corporate policies. Given the size of the data center load and technology companies' zero-
14 carbon corporate policies, many of these customers may become accelerated renewable
15 energy buyers ("ARBs") pursuant to § 56-585.5 G. The energy sales to ARBs are backed
16 out of the RPS Program requirements and the aggregate amount of ARB nameplate
17 capacity is offset from Dominion's procurement requirements pursuant to § 56-585.5 D. If
18 the data center owners do become ARBs, then much of this large data center load could be
19 excluded from Dominion's § 56-585.5 obligations.

20 Thus, not only is there a risk that the 2022 IRP peak load and energy sales forecasts
21 do not materialize, there is also the risk that any peak load or energy sales growth that is
22 realized will come from future ARBs. This exacerbates the risks that captive customers

¹² 5-Year Data Center Plan, Dominion Energy (Dec. 6, 2021), <https://www.pjm.com/-/media/committees-groups/subcommittees/las/2021/20211206/20211206-item-03-dominion-energy-5-yr-data-center-plan.ashx>.

may be required to pay for resources that are not needed. This underscores the importance of relying more heavily on solar PPAs that provide the flexibility to manage this risk. If a high percentage of this future load turns out to be from ARBs, then Dominion can allow the solar PPAs to expire and captive customers will not be burdened with paying for Company-owned solar resources that are not needed.

Q20. ARE THERE ANY OTHER ADVANTAGES PROVIDED BY SOLAR PPA'S?

A20. Yes. In addition to being a useful tool to address the peak load and energy sales forecast risks described above, a heavier reliance on solar PPAs with purchase options would also reduce a number of other risks. Additionally, solar PPAs typically have a lower cost than Company-owned solar resources. The combination of lower costs and lower risks makes the solar PPAs an attractive option for captive customers.

ADVANTAGES OF SOLAR PPAS

Q21. OTHER THAN PEAK LOAD AND ENERGY SALES FORECAST RISK, WHAT OTHER RISKS CAN SOLAR PPA'S ADDRESS?

A21. There are three other categories of risk that can be better addressed by solar PPAs with purchase options compared to Company-owned solar facilities. These are:

- Performance risk;
- Project development risk; and
- Risk of damaged solar cells during transportation or installation.

Q22. PLEASE DISCUSS THE PERFORMANCE RISK ASSOCIATED WITH INTERMITTENT RENEWABLE FACILITIES.

A22. The Commission has previously recognized the performance risks associated with Company-owned solar resources and required a performance guarantee for the US-3 solar

1 facilities and the US-4 solar facility. Thus far, the US-3 facilities have underperformed,
 2 triggering the performance guarantee, which ultimately provided a benefit to captive
 3 customers.¹³ The Commission similarly recognized the performance risks associated with
 4 the proposed Company-owned CVOW offshore wind project. The Commission's August
 5 4, 2022 Final Order in Case No. PUR-2021-00142 imposed a performance standard to
 6 protect captive customers from the risk of underperformance from the CVOW project.¹⁴

7 It should be noted that the Commission declined to impose a performance guarantee
 8 on Company-owned solar resources in Case No. PUR-2021-00134 for the CE-1 solar
 9 projects. Nevertheless, the CE-1, CE-2, and proposed CE-3 Company-owned solar
 10 resources still have the same performance risks as the US-3 and US-4 solar facilities.

11 If a Company-owned intermittent renewable project does not contain a performance
 12 guarantee, then captive customers bear 100% of the underperformance risk. A performance
 13 guarantee shifts some of this performance risk to shareholders. Dominion prefers that
 14 shareholders not assume any performance risk and has previously resisted the imposition
 15 of performance guarantees.

16 In prior cases, the question of who should bear this performance risk has been
 17 presented as a binary choice between customers versus shareholders. Solar PPAs with
 18 purchase options offer a third way to address this performance risk. If a solar project starts
 19 off as a solar PPA and then Dominion hypothetically exercises the purchase option in year
 20 twelve, the performance risk is assumed by the counterparty to the solar PPA agreement

¹³ Final Order, *Application of Virginia Electric and Power Company for revision of rate adjustment clause: Rider US-3, Colonial Trail West and Spring Grove 1 Solar Projects, for the rate year commencing June 1, 2022*, Case No. PUR-2021-00118 (Mar. 24, 2022) at 2.

¹⁴ This performance guarantee, of course, was replaced by a construction cost cap. See Order on Reconsideration, *Application of Virginia Electric and Power Company for approval and certification of the Coastal Virginia Offshore Wind Commercial Project and Rider Offshore Wind, pursuant to § 56-585.1:11, § 56-46.1, § 56-265.1 et seq., and § 56-585.1 A 6 of the Code of Virginia*, Case No. PUR-2021-00142 (Dec. 15, 2022) at 6.

1 over the first twelve years of the solar project's service life. Thus, neither customers nor
2 shareholders would assume any performance risks for the first twelve years of the solar
3 facility's service life in this hypothetical scenario. Further, Dominion would not have to
4 estimate what the performance profile for the solar project will be as there would be a
5 twelve-year track record of its actual performance. This provides the extra benefit of
6 Dominion being able to pick and choose the best performing solar projects for conversion
7 from PPAs to Company-owned resources. Likewise, any solar PPA projects that turn out
8 to be lemons can be avoided.

9 **Q23. PLEASE DISCUSS THE PROJECT DEVELOPMENT RISK ASSOCIATED WITH**
10 **SOLAR FACILITIES.**

11 **A23.** There are numerous challenges with delivering solar projects into commercial operation
12 on time and on budget. These include issues such as unexpected delays in clearing the
13 interconnection queue, local permitting delays, supply-chain issues, and construction
14 delays due to unusual weather conditions. It is not uncommon to see both Company-owned
15 solar facilities and solar PPA projects miss expected commercial operation dates.

16 Given that Dominion does not incur any expenses for a solar PPA until the
17 associated solar facility is placed in service, all of the risks associated with project delays
18 are borne by the counterparty to the solar PPA and none of these risks are borne by either
19 shareholders or customers. In contrast, for Company-owned solar projects, Dominion
20 begins recovering its costs through a rate adjustment clause before the projects are
21 operational (*i.e.*, while the projects are under development) and any delays in the
22 commercial operation date add to the costs of the projects ultimately borne 100% by
23 captive customers.

1 It should be noted, however, that project development risks for third-party solar
2 developers could potentially put the solar PPA projects at risk if the developer cannot bear
3 the project development risks. Unlike Dominion, which can pass along any cost increases
4 to captive customers, the shareholders of these third-party solar developers would realize
5 the cost increases from project delays.

6 **Q24. PLEASE DISCUSS THE RISK ASSOCIATED WITH DAMAGE TO SOLAR**
7 **CELLS DURING TRANSPORTATION OR INSTALLATION.**

8 **A24.** Improper transportation (vibrations) and handling of solar panels during installation
9 (flexing) can cause tiny fractures (microcracks) on solar cells that are invisible to the naked
10 eye. Microcracks can reduce the energy output of solar cells and lead to a higher
11 degradation rate over time. Although I am sure that Dominion is following best practices
12 and quality control protocols, damages can still occur despite their best efforts. This risk is
13 related to the performance risk I discussed above. To the extent that solar cells incur
14 microcrack damages that are not apparent before it is placed in service, such defects will
15 show up in the solar project underperforming after it is placed into service. This risk is
16 avoided entirely for solar PPA projects. For those solar PPA projects that underperform
17 due to damaged solar cells, Dominion can opt to not exercise the purchase option on those
18 projects. In contrast, Dominion's captive customers bear the risks for Company-owned
19 solar projects that underperform due to damaged solar cells.

Q25. ARE THERE ANY ADDITIONAL BENEFITS OR ADVANTAGES OF SOLAR PPA'S THAT ARE NOT CURRENTLY REFLECTED IN DOMINION'S ANALYSIS?

A25. Yes. For those solar PPAs that are allowed to expire at the end of the 20-year term of the PPA, the actual solar facilities associated with the solar PPAs are still physically located in the Dom-Zone and in Virginia. Thus, these solar facilities will continue to indirectly provide capacity and REC benefits after the expiration of the solar PPAs.

Q26. PLEASE DISCUSS THE CAPACITY BENEFITS FROM EXPIRED SOLAR PPA'S.

Q26. The presence of the solar facilities from expired PPAs in the Dom-Zone will indirectly provide a peak load capacity benefit to the Dom-Zone and Dominion. For solar facilities that are interconnected at the distribution level, these facilities will act as “load reducers” and will reduce the level of the PJM coincident peak. The energy production from these facilities is actually consumed by customers on the distribution circuit. Thus, less energy is required to be drawn from the transmission system. This shows up to PJM as a reduced peak load on the transmission system. The amount of energy produced from these facilities during the PJM coincident peak will result in a lower Dom-Zone capacity requirement. This indirect capacity benefit will be realized by all of the LSEs in the Dom-Zone. Since the Dominion LSE represents about 86% of the peak load in the Dom-Zone, approximately 86% of this indirect capacity benefit will flow to Dominion’s customers in the form of a lower capacity requirement.¹⁵

¹⁵ Dominion has previously acknowledged this “load reducer” capacity benefit for distribution level solar resources. See Ex. 20, Rebuttal Testimony of Jeffrey E. Currier, *Application of Virginia Electric and Power Company for revision of rate adjustment clause: Rider US-2, Scott, Whitehouse, and Woodland Solar Power Stations, for the Rate Year Commencing September 1, 2019*, Case No. PUR-2018-00167 (Mar. 7, 2019) at 4:1-4.

1 **Q27. PLEASE DISCUSS THE REC BENEFITS FROM EXPIRED SOLAR PPA'S.**

2 **A27.** The presence of the solar facilities from expired PPAs located in Virginia will continue to
3 produce Virginia-eligible RECs that can be used to satisfy the RPS Program requirements.
4 Thus, there will be a pool of RECs produced from these solar facilities that are available
5 for Dominion to purchase. This additional supply of RECs should put downward pressure
6 on future Virginia-eligible REC prices.

7 **Q28. DO YOU HAVE ANY RECOMMENDATIONS ON THE APPROVAL OF SOLAR**
8 **PPA'S IN THIS CASE?**

9 **A28.** Yes. Any solar PPA that has a lower levelized cost of energy ("LCOE") than the LCOE of
10 the least expensive proposed CE-3 utility scale solar projects will provide more value and
11 fewer risks to customers. Should the Commission determine that the proposed CE-3 utility
12 scale projects are reasonable and prudent in this case, then logic would dictate that those
13 solar PPAs that provide more value and fewer risks at a lower cost are also reasonable and
14 prudent. I recommend that the Commission approve all such solar PPAs over and above
15 the solar PPAs proposed by Dominion.

16 **Q29. IF THE COMMISSION WERE TO ADOPT THIS RECOMMENDATION IN THIS**
17 **CASE, HOW MANY ADDITIONAL SOLAR PPAS WOULD YOU RECOMMEND**
18 **BE APPROVED?**

19 **A29.** Dominion's Filing Schedule 46A, Statement 1, page 105 shows a table that displays the
20 results of Dominion's initial price ranking of conforming solar PPA bids. Based on my
21 calculations, there are eight additional solar PPAs with a combined total of 125 MWs that
22 have a lower LCOE than the CE-3 Project with the lowest LCOE.

COMPANY-OWNED VERSUS THIRD-PARTY RESOURCES

Q30. WHY DOES DOMINION NOT REQUEST APPROVAL FOR ALL SOLAR PPA'S THAT ARE LESS COSTLY THAN COMPANY-OWNED RESOURCES?

A30. Dominion's recommended build plan is guided by its interpretation of § 56-585.5 D of the Code that 35% of the generation capacity procured shall be from solar and onshore wind facilities owned by third-parties. Dominion's interpretation is that this 35% is an exact number and that Dominion cannot procure more than 35% nor less than 35% from third-party resources. This interpretation of the Code language has resulted in Dominion leaving out lower cost solar PPAs in prior RPS cases and in the current case.

Q31. DOES DOMINION'S BUILD PLAN CONTAINED IN ITS RPS DEVELOPMENT PLAN REFLECT THIS 35% - 65% SPLIT?

A31. Figure 3 on page 5 of the RPS Development Plan shows Dominion's projected Company-owned resources and PPA resources by year. The split of the cumulative total through 2035 shown in this table is 65% Company-owned and 35% PPAs. These percentages are rounded numbers. I have used the data in Figure 3 to calculate the cumulative split by year over the period. This is shown in the table below.

Cumulative Company-Owned / PPA Split by Year

	Company			Company-	
	Owned	PPAs	Total	Owned	PPAs
	<u>MWs</u>	<u>MWs</u>	<u>MWs</u>	<u>Percent</u>	<u>Percent</u>
Prior					
Years	1,738.8	927.0	2,665.8	65.2%	34.8%
2025	2,087.8	1,276.8	3,364.6	62.1%	37.9%
2026	2,902.8	1,641.8	4,544.6	63.9%	36.1%
2027	3,738.8	2,016.8	5,755.6	65.0%	35.0%
2028	4,393.8	2,366.8	6,760.6	65.0%	35.0%
2029	5,048.8	2,694.8	7,743.6	65.2%	34.8%
2030	5,703.8	3,029.8	8,733.6	65.3%	34.7%
2031	6,358.8	3,364.8	9,723.6	65.4%	34.6%
2032	7,013.8	3,699.8	10,713.6	65.5%	34.5%
2033	7,668.8	4,034.8	11,703.6	65.5%	34.5%
2034	8,318.8	4,374.8	12,693.6	65.5%	34.5%
2035	8,968.8	4,729.8	13,698.6	65.5%	34.5%

1 The first thing that should be noted in this table is that the actual split of the
2 cumulative total through 2035 is 65.5% Company-owned and 34.5% PPAs. Thus,
3 Dominion's plan does not hit 35% of resources being third-party resources exactly. In fact,
4 the cumulative percentage coming from third-party PPAs exactly achieves 35% in just two
5 years.

6 **Q32. WHAT IS THE ENVIRONMENTAL RESPONDENT'S POSITION ON THE SPLIT**
7 **BETWEEN COMPANY-OWNED RESOURCES VERSUS THIRD-PARTY**
8 **RESOURCES?**

9 **A32.** On advice of counsel, the Environmental Respondent's position is that the § 56-585.5 D
10 Code language that requires that 35% of the generation capacity procured shall be from
11 solar and onshore wind facilities owned by third-parties is a floor rather than an exact
12 number. This legal issue was briefed by parties in the 2021 RPS case. It is my

1 understanding that the Commission did not resolve this legal issue in that case. At a
2 minimum, since the Commission has left the legal question open, there is nothing that
3 would prevent the Commission from requiring Dominion, in future IRPs and RPS planning
4 endeavors, to model the ratepayer cost of scenarios where PPAs are not capped at 35%.

5 **Q33. DO YOU SEE ANY PROBLEMS WITH TRYING TO ACHIEVE AN EXACT**
6 **SPLIT OF 65% COMPANY-OWNED AND 35% PPA'S?**

7 **A33.** Yes. Setting aside the legal issue, trying to achieve an exact split will be difficult to achieve
8 in practice. As I mentioned earlier, there are a number of project development risks that
9 can lead to a project missing its COD. This is true for both Company-owned projects and
10 PPA projects. To the extent that delays are incurred for either a Company-owned solar
11 project or a solar PPA project, this will cause Dominion to miss the planned exact 65% -
12 35% cumulative split in a given year.

13 Further, since third-party developers bear the project development risk associated
14 with solar PPA projects, it is possible, and maybe likely, that some of these developers may
15 not be able to bear this risk and some of the previously approved solar PPA projects may
16 not be delivered. This would negatively impact Dominion's planned split and almost
17 guarantee that less than 35% of the generation capacity will be owned by third-parties.

18 One way to address this issue would be to approve all cost-effective solar PPAs in
19 the early years. While this would result in a cumulative percentage greater than 35% of
20 generation capacity coming from third-party PPAs in the early years of the period, it would
21 also provide some headroom to absorb the loss of any previously approved solar PPA
22 projects.

Lastly, if Dominion's goal is to achieve an exact 65% - 35% cumulative split by 2035, utilizing the purchase option to convert solar PPAs to Company-owned resources would be a useful tool to meet that objective. Dominion basically has an ownership claim on these solar PPAs. Trying to meet a rigid 65% - 35% cumulative split in each year of the period is not practicable and negates the flexibility that the purchase option offers to achieve that split in 2035.

MODELING ASSUMPTIONS

Q34. DO YOU HAVE ANY COMMENTS ON DOMINION'S MODELING ASSUMPTIONS?

A34. Yes. This is another instance where my comments may be better suited to be addressed in Dominion's 2023 formal IRP filing. I have two concerns. First, Dominion ignores the presence of expired solar PPAs in its modeling. Secondly, Dominion assumes that its coal units are dispatched under economic dispatch in its modeling rather than reflecting how the coal units are dispatched in actual practice.

Q35. WHAT ARE YOUR CONCERNS WITH DOMINION'S MODELING ASSUMPTION WITH REGARD TO EXPIRED SOLAR PPA'S?

A35. As I discussed earlier in my testimony, after a solar PPA expires, the associated solar facility is still physically located in the Dom Zone and has 15 years of service life left. Dominion's modeling assumption essentially treats these solar facilities as vanishing at the end of the PPA term. Dominion's response to APV interrogatory 3-4 (Attachment GLA-3) states the following:

For existing PPAs, the Company assumes that there is no energy or capacity after the PPA term ends. The Company models the contract terms in its long-term system modeling because the Company cannot assume rights to the project output after its contracted term.

I agree that Dominion cannot count the capacity value of the solar facilities towards satisfying its PJM capacity requirement after the PPAs expire. However, the solar facilities that are connected at the distribution level will nonetheless provide an indirect capacity benefit to Dominion as load reducers. This occurs because the production from these distribution level solar facilities results in a lower capacity requirement for Dominion. Thus, the capacity cannot directly be used to meet the PJM capacity target, but these facilities will indirectly lower the PJM capacity target that must be met. Ignoring the presence of these load reducers in the modeling will tend to overstate the PJM capacity requirement and lead to the model selecting more capacity resources than needed.

I also agree that Dominion will not have a claim on the energy or RECs produced by these solar facilities after the PPAs expire. However, the unbundled Virginia-eligible RECs would still be available for purchase by Dominion. It may make more sense and would likely be less costly, to purchase the available unbundled RECs from these expired solar PPA facilities rather than build brand-new solar projects to obtain the requisite number of RECs to meet the RPS Program requirements. It is not clear that Dominion's modeling recognizes the existence of the future availability of RECs from expired solar PPA facilities.

Q36. WHAT ARE YOUR CONCERNS WITH DOMINION'S MODELING ASSUMPTION WITH REGARD TO COAL UNIT DISPATCH?

A36. Dominion assumed that its coal units will be dispatched by the PJM system operator under *economic dispatch* in the modeling performed for the 2022 IRP Update.¹⁶ However, Dominion's fleet is not always dispatched on an economic basis. For instance, as I have

¹⁶ Company Response to APV Set 3-21 (Attachment GLA-4).

1 testified previously, Dominion's VCHEC and Mt. Storm coal units are "self-scheduled" as
2 "must-run" for a significant number of their operational hours.¹⁷¹⁸ There are numerous
3 reasons why Dominion may designate its coal units as must-run. The two main reasons are:
4 (i) to comply with testing requirements such as environmental requirements, permit
5 requirements, and PJM requirements; and (ii) to avoid shutdown and startup costs during
6 periods when the units are not economic and would not be dispatched by the PJM system
7 operator.

8 At a minimum, I believe Dominion should be required to designate the hours
9 associated with testing requirements for its coal units as must-run hours in the modeling.
10 Required testing for coal units is scheduled in advance and known to Dominion. The
11 number of hours required for testing is not insignificant. In Dominion's 2022 Fuel Factor
12 case, Case No. PUR-2022-00064, it was revealed that Dominion's VCHEC unit was
13 designated as must-run for 17 consecutive days from January 27, 2021 through February
14 12, 2021 for stack testing and to meet the DEQ biomass air permit requirement.¹⁹ Further,
15 VCHEC was designated as must-run for 18 consecutive days in July 2021 for emissions
16 testing.²⁰ In APCo's recent E-RAC proceeding, the Commission expressly required APCo
17 to "record the hours of each day that Clinch River self-schedules, the associated megawatts

¹⁷ Ex. 18, Direct Testimony of Gregory L. Abbott, *Application of Virginia Electric and Power Company to revise its fuel factor pursuant to § 56-249.6 of the Code of Virginia*, Case No. PUR-2022-00064 (June 16, 2022) at 6-7.

¹⁸ The percentage of MWhs generated under must-run conditions is lower because only the economic minimum number of MWs are designated as must-run.

¹⁹ Hearing Transcript, *Application of Virginia Electric and Power Company to revise its fuel factor pursuant to § 56-249.6 of the Code of Virginia*, Case No. PUR-2022-00064 (July 7, 2022) at 285:3-13.

²⁰ *Id.* at 286:23-287:12.

1 that are self-scheduled, and the reason for each self-scheduling²¹ I recommend this
 2 for Dominion's coal units as well.

3 **Q37. DOES THIS CONCLUDE YOUR TESTIMONY?**

4 **A37. Yes.**

²¹ Final Order, *Petition of Appalachian Power Company For approval of a rate adjustment clause, the E-RAC, for costs to comply with state and federal environmental regulations pursuant to § 56-585.1 A 5 e of the Code of Virginia*, Case No. PUR-2022-00001 (Nov. 21, 2022) at 3.

Attachment GLA-1

2017-40007

Gregory Abbott Testimonies/Reports

Proceeding	Case/Docket No.	On Behalf of:
Dale Service Corporation For General Increase in Rates	Virginia SCC Case No. PUE-2001-00200	Virginia SCC Staff
CPV Cunningham Creek LLC For Approval of a Generation Certificate	Virginia SCC Case No. PUE-2001-00477	Virginia SCC Staff
CPV Warren LLC For Approval of a Generation Certificate	Virginia SCC Case No. PUE-2002-00075	Virginia SCC Staff
Dale Service Corporation For Review of Changes to Terms and Conditions	Virginia SCC Case No. PUE-2002-00092	Virginia SCC Staff
Virginia Natural Gas, Inc. For Approval of a Weather Normalization Adjustment Rider	Virginia SCC Case No. PUE-2002-00237	Virginia SCC Staff
Virginia-American Water Company For General Increase in Rates	Virginia SCC Case No. PUE-2002-00375	Virginia SCC Staff
Community Electric Cooperative For Approval of Retail Access Tariffs and Terms and Conditions of Service for Retail Access	Virginia SCC Case No. PUE-2003-00007	Virginia SCC Staff
A&N Electric Cooperative For Review of Tariffs and Terms and Conditions of Service for Retail Service	Virginia SCC Case No. PUE-2003-00279	Virginia SCC Staff
Central Virginia Electric Cooperative For Approval of Its Plan to Implement Retail Access	Virginia SCC Case No. PUE-2003-00327	Virginia SCC Staff
Atmos Energy Corporation For an Increase in Rates	Virginia SCC Case No. PUE-2003-00507	Virginia SCC Staff
Virginia-American Water Company For General Increase in Rates	Virginia SCC Case No. PUE-2003-00539	Virginia SCC Staff
Washington Gas Light Company For Approval of an Experimental Weather Normalization Adjustment	Virginia SCC Case No. PUE-2001-00010	Virginia SCC Staff
Craig-Botetourt Electric Cooperative For a General Increase in Electric Rates	Virginia SCC Case No. PUE-2005-00012	Virginia SCC Staff
Virginia Natural Gas, Inc. For Approval of a Performance Based Rate Regulation Methodology	Virginia SCC Case No. PUE-2005-00057	Virginia SCC Staff

Virginia Natural Gas, Inc. For Investigation of Justness and Reasonableness of Current Rates, Charges, and Terms and Conditions of Service	Virginia SCC Case No. PUE-2005-00062	Virginia SCC Staff
Roanoke Gas Company For and Expedited Increase in Rates	Virginia SCC Case. No. PUE-2005-00075	Virginia SCC Staff
Highland New Wind Development, LLC For Approval to Construct, Own and Operate an Electric Generation Facility	Virginia SCC Case. No. PUE-2005-00101	Virginia SCC Staff
Dale Service Corporation For an Expedited Increase in Rates	Virginia SCC Case. No. PUE-2006-00070	Virginia SCC Staff
Virginia Natural Gas, Inc. For Approval of an Experimental Weather Normalization Adjustment for General Service Customers	Virginia SCC Case. No. PUE-2006-00095	Virginia SCC Staff
Roanoke Gas Company For an Expedited Increase in Rates	Virginia SCC Case. No. PUE-2006-00099	Virginia SCC Staff
CPV Warren, LLC For Approval of a Generation Certificate	Virginia SCC Case. No. PUE-2007-00018	Virginia SCC Staff
Appalachian Power Company For Adjustment to Capped Electric Rates	Virginia SCC Case. No. PUE-2007-00069	Virginia SCC Staff
Old Dominion Electric Coop. & Columbia Gas of Virginia For Approval of a Certificate to Acquire Ownership Interest	Virginia SCC Case. No. PUE-2007-00088	Virginia SCC Staff
James River Cogeneration Company For a Certificate to Operate as an Electric Generating Facility	Virginia SCC Case. No. PUE-2007-00092	Virginia SCC Staff
Spectra Energy Virginia Pipeline Co. For Cancellation of Certificates	Virginia SCC Case. No. PUE-2007-00106	Virginia SCC Staff
Appalachian Power Company For Approval to Participate in the Virginia Renewable Energy Portfolio Standard Program	Virginia SCC Case. No. PUE-2008-00003	Virginia SCC Staff
Atmos Energy Corporation For an Expedited Increase in Rates	Virginia SCC Case. No. PUE-2008-00007	Virginia SCC Staff
Virginia Electric and Power Company For Approval of a Generation Certificate	Virginia SCC Case. No. PUE-2008-00014	Virginia SCC Staff
Columbia Gas of Virginia, Inc. For Approval of an Experimental Weather Normalization Adjustment Mechanism	Virginia SCC Case. No. PUE-2008-00074	Virginia SCC Staff

Roanoke Gas Company For an Expedited Increase in Rates	Virginia SCC Case. No. PUE-2008-00088	Virginia SCC Staff
Mecklenburg Electric Cooperative For a General Increase in Electric Rates	Virginia SCC Case. No. PUE-2009-00006	Virginia SCC Staff
Virginia Electric and Power Company For Approval of Annual Filing of Rider S	Virginia SCC Case. No. PUE-2000-00011	Virginia SCC Staff
Virginia Electric and Power Company For Approval of a Rate Adjustment Clause for Recovery of the Costs of the Bear Garden Generating Station	Virginia SCC Case. No. PUE-2009-00017	Virginia SCC Staff
Washington Gas Light Company For Approval of Natural Gas Conservation and Ratemaking Efficiency Plan including a Decoupling Mechanism	Virginia SCC Case. No. PUE-2009-00064	Virginia SCC Staff
Craig-Botetourt Electric Cooperative For a General Increase in Electric Rates	Virginia SCC Case. No. PUE-2009-00065	Virginia SCC Staff
Appalachian Power Company For Approval of Purchase Power Agreements as Part of Its Participation in the Virginia Energy Portfolio Standard Program	Virginia SCC Case. No. PUE-2009-00102	Virginia SCC Staff
Columbia Gas of Virginia, Inc. For Authority to Increase Rates and Charges and to Revise the Terms and Conditions	Virginia SCC Case. No. PUE-2010-00017	Virginia SCC Staff
Virginia Electric and Power Company For Approval to Continue Two Rate Adjustment Clauses, Riders C1 and C2	Virginia SCC Case. No. PUE-2010-00084	Virginia SCC Staff
Appalachian Power Company Proposed Pilot Programs on Dynamic Rate Structures for Renewable Generation Facilities	Virginia SCC Case. No. PUE-2010-00134	Virginia SCC Staff
Virginia Natural Gas, Inc. For an Increase in Base Rates and Authority to Revise the Terms and Conditions	Virginia SCC Case. No. PUE-2010-00142	Virginia SCC Staff
Virginia Electric and Power Company For Approval to Establish an Electric Vehicle Pilot Program	Virginia SCC Case. No. PUE-2011-00014	Virginia SCC Staff
Appalachian Power Company For Approval of a Rate Adjustment Clause, RPS-RAC, to Recover the Incremental Costs of Participation in the Virginia Renewable Energy Portfolio Standard Program	Virginia SCC Case. No. PUE-2010-00034	Virginia SCC Staff

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Virginia Electric and Power Company For Approval to Implement New Demand-Side Management Programs and For Approval of Two Updated Rate Adjustment Clauses	Virginia SCC Case. No. PUE-2011-00093	Virginia SCC Staff
Virginia-American Water Company For a General Increase in Rates	Virginia SCC Case. No. PUE-2011-00127	Virginia SCC Staff
Virginia Electric and Power Company To Revise a Rate Adjustment Clause: Rider R	Virginia SCC Case. No. PUE-2012-00068	Virginia SCC Staff
Virginia Electric and Power Company For Revision of Rate Adjustment Clause: Rider B	Virginia SCC Case. No. PUE-2012-00072	Virginia SCC Staff
Appalachian Power Company For Approval of the Recovery of Incremental Costs of Participation in the Renewable Energy Portfolio Program	Virginia SCC Case. No. PUE-2012-00094	Virginia SCC Staff
Virginia Electric and Power Company For Approval & Certification of Proposed Brunswick Co. Power Station	Virginia SCC Case. No. PUE-2012-00128	Virginia SCC Staff
Atmos Energy Corporation For Approval of a Special Contract for Gas Transportation Service	Virginia SCC Case. No. PUE-2013-00038	Virginia SCC Staff
Northern Virginia Electric Cooperative For Approval of Pole Attachment Rates and Terms and Conditions	Virginia SCC Case. No. PUE-2013-00055	Virginia SCC Staff
Virginia Electric and Power Company Integrated Resource Plan	Virginia SCC Case. No. PUE-2013-00088	Virginia SCC Staff
Virginia Electric and Power Company For Revision of Rate Adjustment Clause: Rider BW	Virginia SCC Case. No. PUE-2013-00122	Virginia SCC Staff
Appalachian Power Company Petition for Approval of Rate Adjustment Clause	Virginia SCC Case. No. PUE-2014-00007	Virginia SCC Staff
Appalachian Power Company Application for a 2014 Biennial Review of the Rates, Terms and Conditions for the Provision of Generation, Distribution and Transmission Services	Virginia SCC Case. No. PUE-2014-00026	Virginia SCC Staff
Virginia Electric and Power Company For Establishment of a Rate Adjustment Clause: Rider U, New Underground Distribution Facilities	Virginia SCC Case. No. PUE-2014-00089	Virginia SCC Staff
Appalachian Power Company Petition for Approval of Rate Adjustment Clause Related to its Participation in the Renewable Portfolio Energy Portfolio Program	Virginia SCC Case. No. PUE-2015-00034	Virginia SCC Staff

Virginia Electric and Power Company Integrated Resource Plan	Virginia SCC Case. No. PUE-2015-00035	Virginia SCC Staff
Washington Gas Light Company Application for Approval of a Natural Gas Supply Investment Plan	Virginia SCC Case. No. PUE-2015-00055	Virginia SCC Staff
Virginia Electric and Power Company For Approval of Special Rates, Terms and Conditions	Virginia SCC Case. No. PUE-2015-00103	Virginia SCC Staff
Virginia Electric and Power Company For Approval to Establish Experimental Companion Rates Designated Rate Schedule MBR - GS-3 and Rate Schedule MBR - GS-4	Virginia SCC Case. No. PUE-2015-00108	Virginia SCC Staff
Virginia Electric and Power Company For Establishment of a Rate Adjustment Clause: Rider U, New Underground Distribution Facilities	Virginia SCC Case. No. PUE-2015-00114	Virginia SCC Staff
Atmos Energy Corporation Application for Expedited Approval of a Special Contract for Gas Transportation Service	Virginia SCC Case. No. PUE-2015-00125	Virginia SCC Staff
Virginia Electric and Power Company Integrated Resource Plan	Virginia SCC Case. No. PUE-2016-00049	Virginia SCC Staff
Virginia Electric and Power Company For Revision of a Rate Adjustment Clause: Rider U	Virginia SCC Case. No. PUE-2016-00136	Virginia SCC Staff
Appalachian Power Company For Approval of a Wind G Rate Adjustment Clause	Virginia SCC Case. No. PUR-2017-00031	Virginia SCC Staff
Virginia Electric and Power Company Integrated Resource Plan	Virginia SCC Case. No. PUR-2017-00051	Virginia SCC Staff
Virginia Electric and Power Company For Approval to Establish Experimental Companion Tariff, Designated Schedule RF	Virginia SCC Case. No. PUR-2017-00137	Virginia SCC Staff
Virginia Electric and Power Company Integrated Resource Plan	Virginia SCC Case. No. PUR-2018-00065	Virginia SCC Staff
Virginia Electric and Power Company For Approval of a Rate Adjustment Clause, Designated Rider E	Virginia SCC Case. No. PUR-2018-00195	Virginia SCC Staff
Virginia Electric and Power Company For Approval & Certification of Proposed US-3 Solar Projects and for Approval of a Rate Adjustment Clause, Designated Rider US-3	Virginia SCC Case. No. PUR-2018-00101	Virginia SCC Staff

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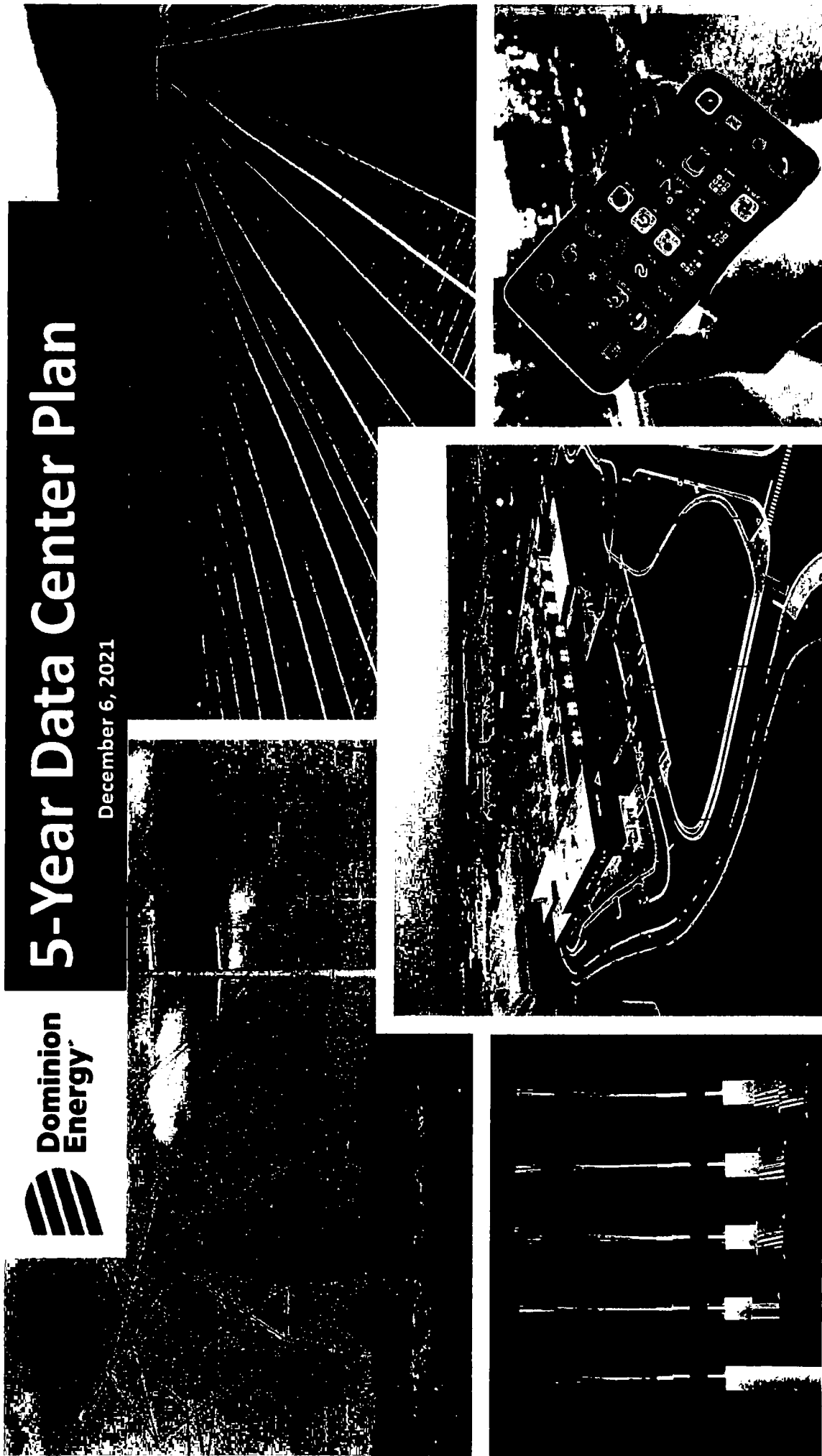
Virginia Electric And Power Company For Prudency Determination with Respect to the Coastal Virginia Offshore Wind Project	Virginia SCC Case. No. PUR-2018-00121	Virginia SCC Staff
Virginia Electric And Power Company For Revision of Rate Adjustment Clause: Rider US-3	Virginia SCC Case. No. PUR-2019-00104	Virginia SCC Staff
Virginia Electric And Power Company For Approval & Certification of Proposed US-4 Solar Projects and for Approval of a Rate Adjustment Clause, Designated Rider US-4	Virginia SCC Case. No. PUR-2019-00105	Virginia SCC Staff
Virginia Electric And Power Company For a Prudency Determination with Respect to the Westmoreland Solar Power Purchase Agreement	Virginia SCC Case. No. PUR-2019-00133	Virginia SCC Staff
Virginia Electric And Power Company Integrated Resource Plan	Virginia SCC Case. No. PUR-2020-00035	Virginia SCC Staff
Virginia Electric And Power Company Establishing 2020 RPS Proceeding	Virginia SCC Case. No. PUR-2020-00134	Virginia SCC Staff
Appalachian Power Company Establishing 2020 RPS Proceeding	Virginia SCC Case. No. PUR-2020-00135	Virginia SCC Staff
Virginia Electric And Power Company Allocating RPS Costs to Certain Customers of Virginia Electric And Power Company	Virginia SCC Case. No. PUR-2020-00164	Virginia SCC Staff
Virginia Electric And Power Company To Revise Its Fuel Factor	Virginia SCC Case. No. PUR-2022-00064	Appalachian Voices
Appalachian Power Company 2022 Integrated Resource Plan Filing	Virginia SCC Case. No. PUR-2022-00051	Appalachian Voices
Roanoke Gas Company For an Expedited Rate Increase	Virginia SCC Case. No. PUR-2022-00205	Roanoke Gas Company

Attachment GLA-2



5-Year Data Center Plan

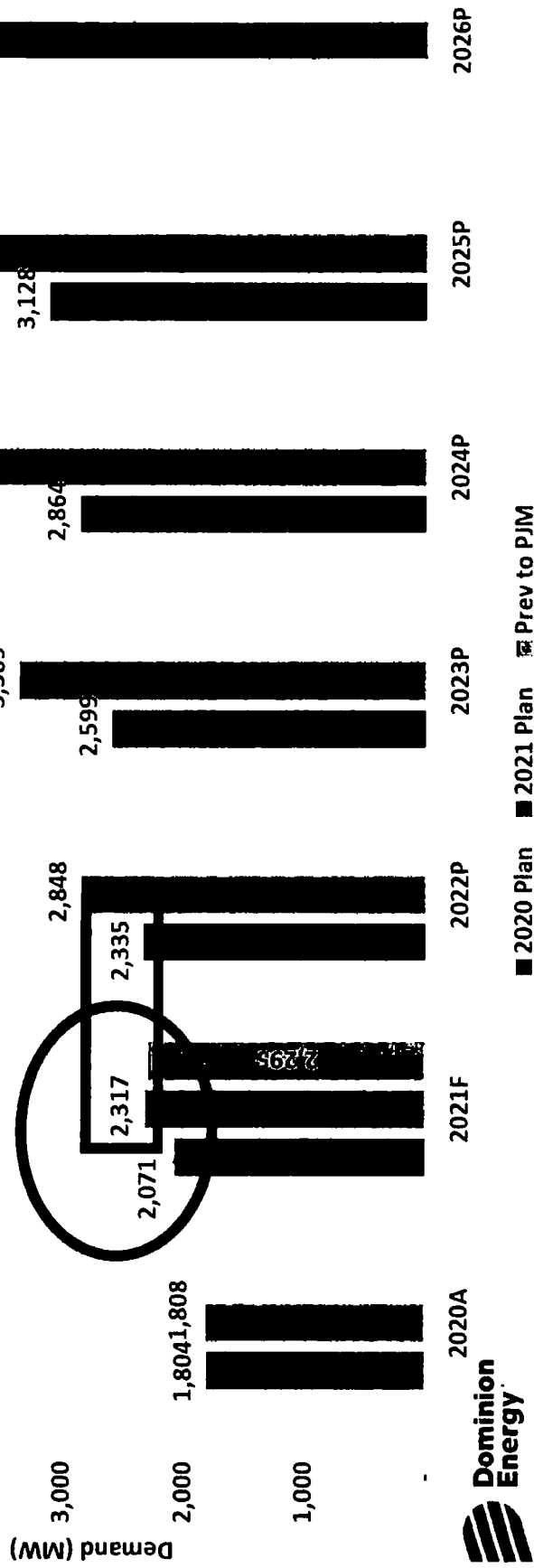
December 6, 2021



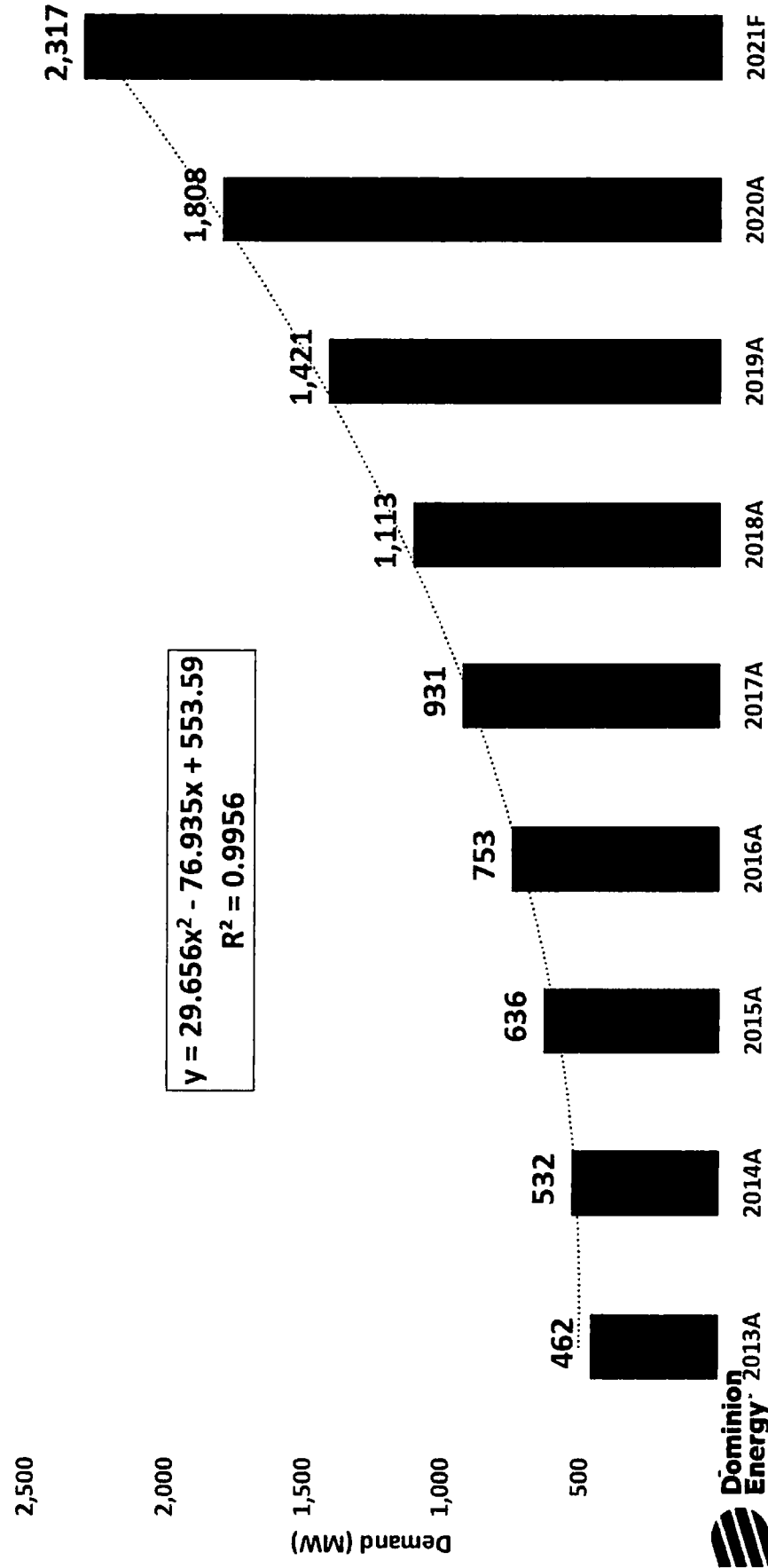
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Comparison of 2020 to 2021 5-Year Plans

- Exceed prior year's 2021 plan value by 246 MW
- Achieved prior year's 2022 value in 2021



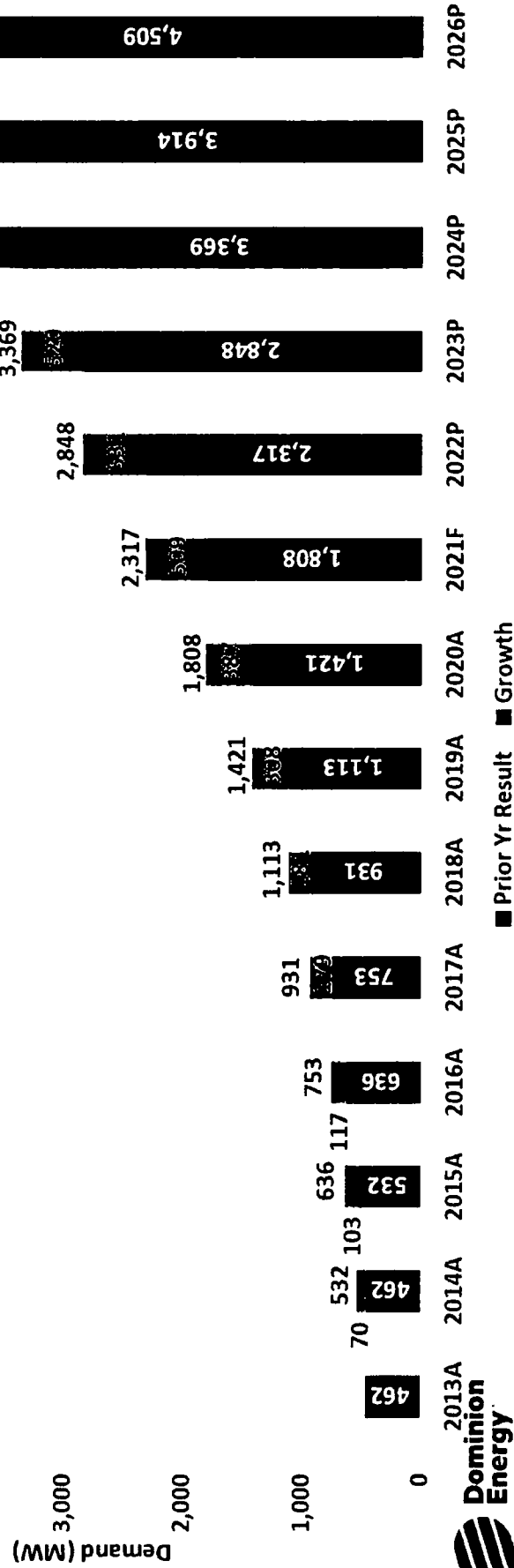
Historical Demand Growth



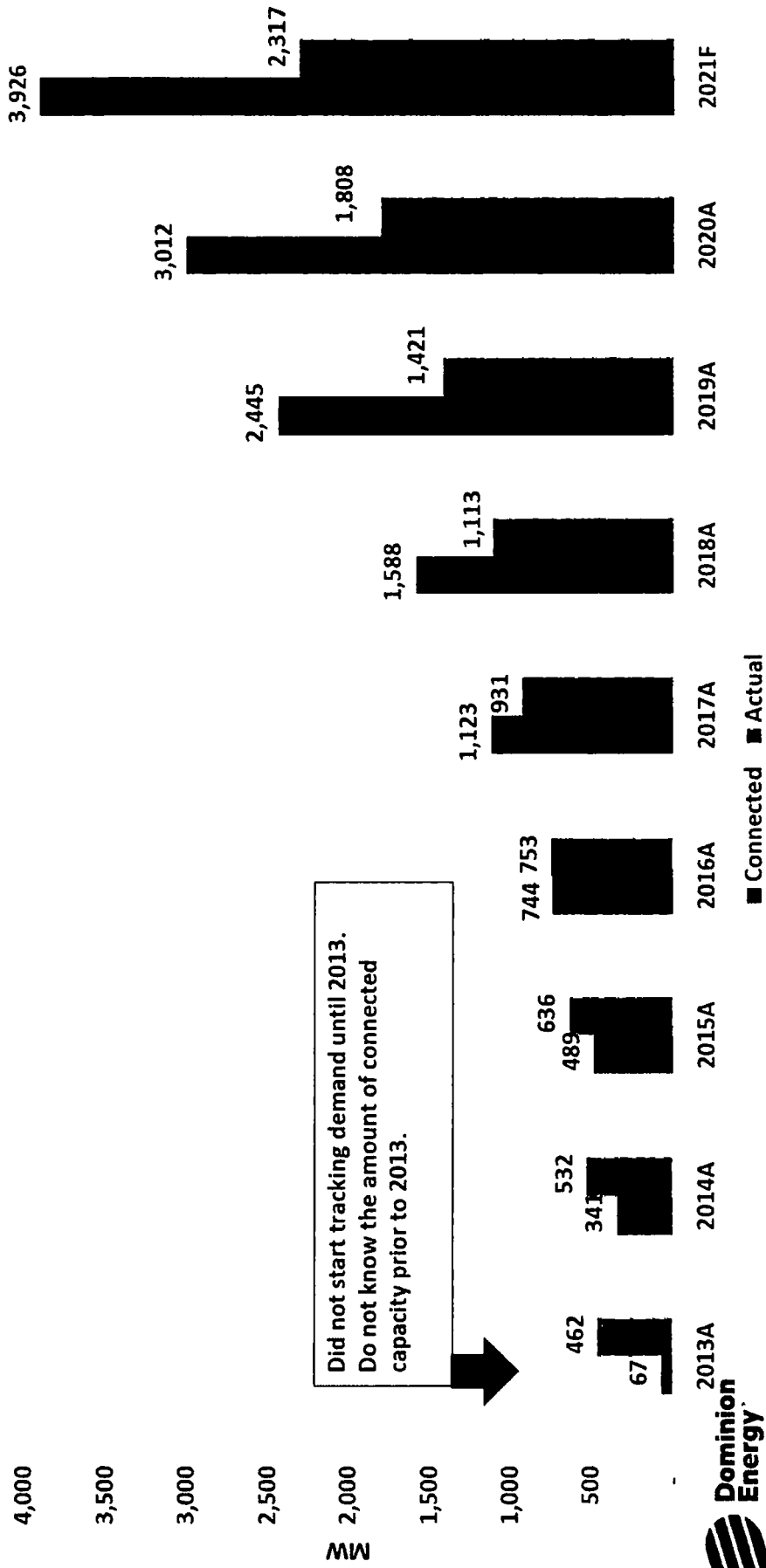
Note: This is a regression formula of history and is not used to forecast future demand

Future Growth

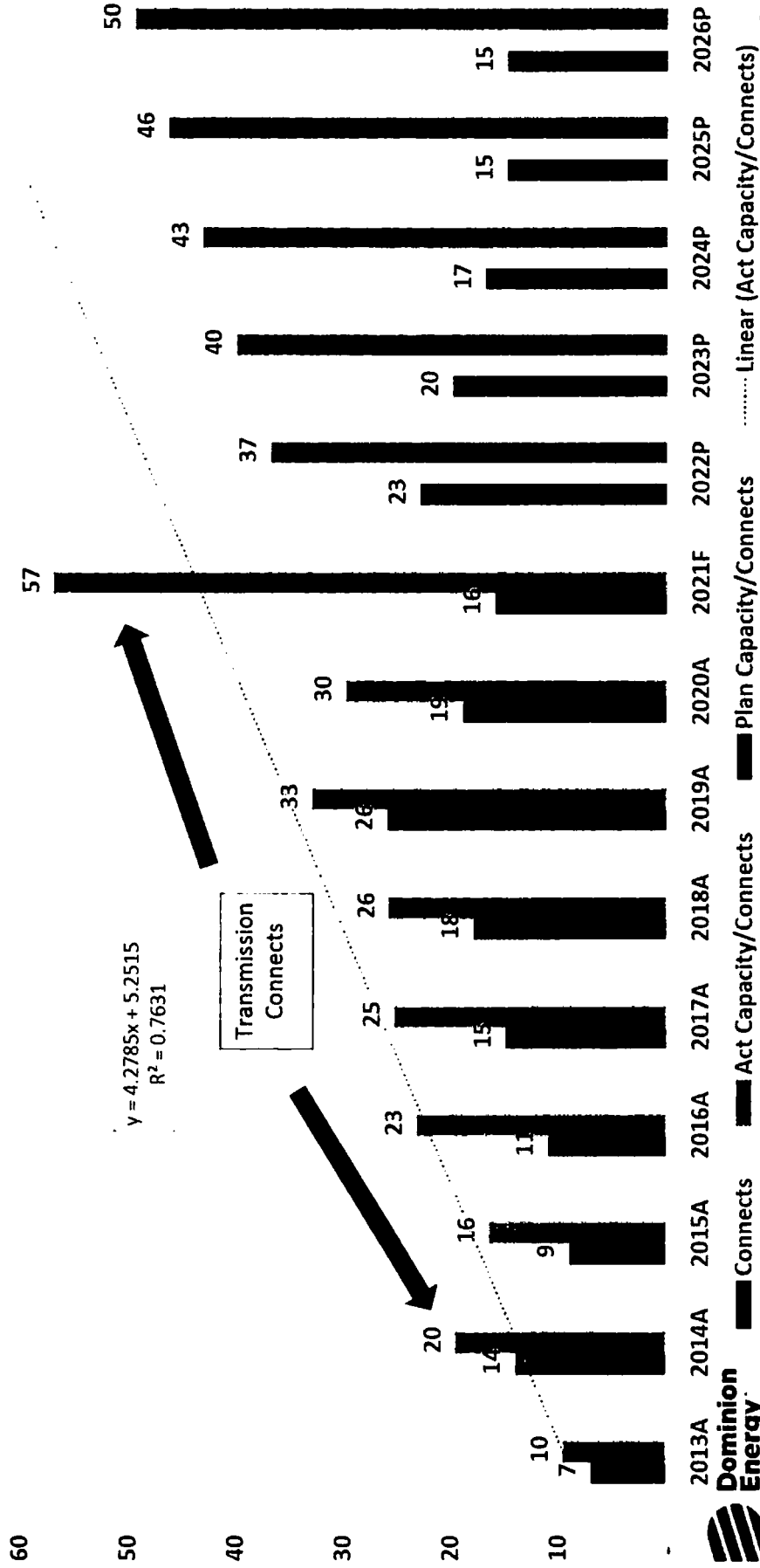
Change in Growth Year-to-Year					
19-20	20-21	21-22	22-23	23-24	24-25
79	122	22	(11)	25	50
25-26	50				



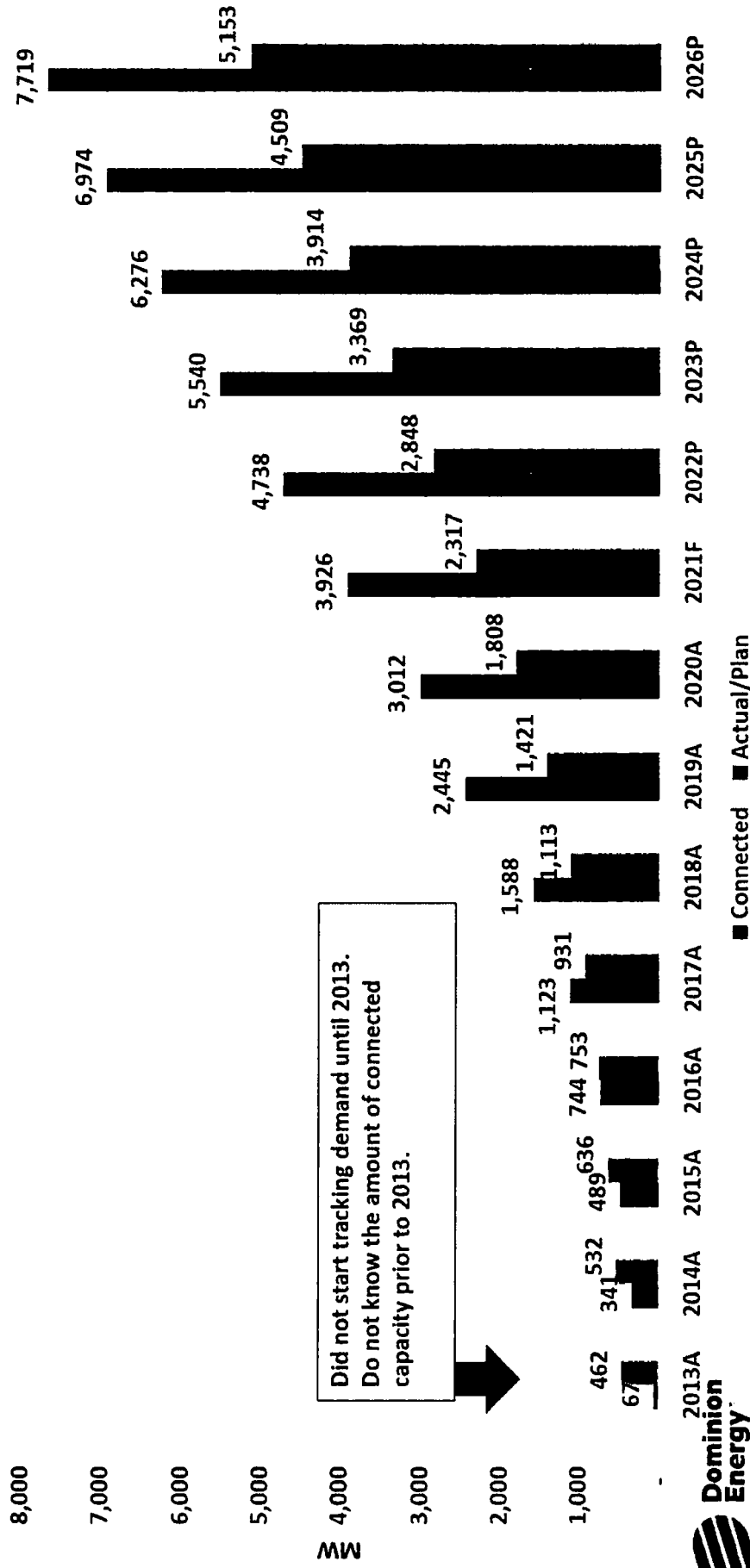
New Connect Capacity



Connects and Capacity per Connect (MW)

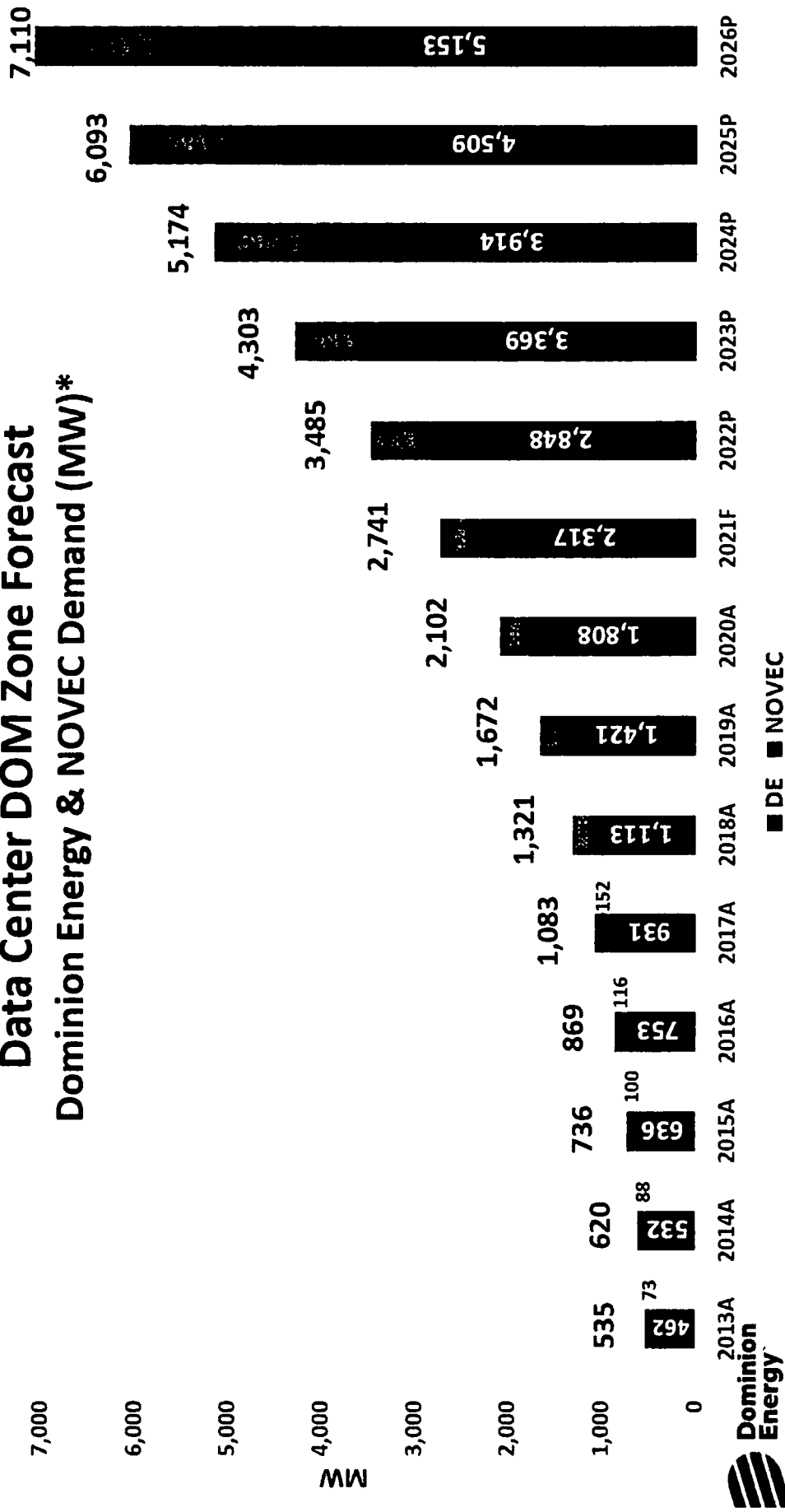


New Connect Capacity vs. Plan



Data Center DOM Zone Forecast

Dominion Energy & NOVEC Demand (MW)*



*The data does not include substantial growth in Southside Virginia cooperative service territory

Questions



Attachment GLA-3

2022-00007

Virginia Electric and Power Company
Case No. PUR-2022-00124
Appalachian Voices
Third Set

The following response to Question No. 4 of the Third Set of Interrogatories and Requests for Production of Documents propounded by Appalachian Voices received on December 1, 2022, has been prepared under my supervision.

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

Question No. 4

In the system modeling performed in developing the RPS plan, what assumptions does Dominion make about the energy and capacity from the existing solar PPAs at the end of each PPA term? If the assumption is that the energy and capacity are no longer available, please explain why. If the assumption is something else, please explain.

Response:

In responding to this request, the Company assumes that "RPS plan" refers to the long-term system modeling completed for the Company's 2022 IRP Update that was incorporated into the 2022 RPS Development Plan, Section V.

For existing PPAs, the Company assumes that there is no energy or capacity after the PPA term ends. The Company models the contract terms in its long-term system modeling because the Company cannot assume rights to the project output after its contracted term.

Attachment GLA-4

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Virginia Electric and Power Company
Case No. PUR-2022-00124
Appalachian Voices
Third Set

The following response to Question No. 21 of the Third Set of Interrogatories and Requests for Production of Documents propounded by Appalachian Voices received on December 1, 2022, has been prepared under my supervision.

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

Question No. 21

Please reference Dominion's response to APV Interrogatory No. 2-2 indicating that the PLEXOS modeling assumes economic dispatch of its generation units. Please confirm that Dominion did not model its actual practice of designating its coal units as "must-run" or "self-scheduled" rather than relying solely on economic dispatch by the PJM system operator.

Response:

The Company did not designate its coal units as "must run" in the PLEXOS model.

20221221

CERTIFICATE OF SERVICE

I hereby certify that the following have been served with a true and accurate copy of the foregoing via electronic mail:

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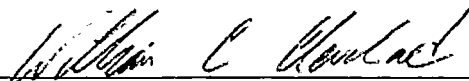
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