COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

PREFILED STAFF TESTIMONY

Ex Parte: **In the matter of baseline determination, methodologies for evaluation, measurement, and verification of existing demand-side management programs, and the consideration of a standardized presentation of summary data for Virginia Electric and Power Company**

Public Version

Volume I of II

PUR-2020-00156

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PART A

Summary of the Testimony of David J. Dalton

My testimony addresses Virginia Electric and Power Company's ("Dominion" or "Company") filing ("Initial Filing") in response to the questions posed by the State Corporation Commission ("Commission") in the Commission's Order Initiating Proceeding[1] in the instant case regarding the evaluation, measurement, and verification ("EM&V") of Dominion's currently-approved and ongoing demand-side management ("DSM" or "energy efficiency") programs. Additionally, my testimony:

- Discusses the purpose of EM&V;
- Addresses the Company's current EM&V strategies and methodologies for their current energy efficiency programs;
- Discusses the implications on EM&V of statutory changes contained within the Virginia Clean Economy Act ("VCEA");[2]
- Recommends that the proposed summary "dashboard" format include all information on which the Commission is required to report to the General Assembly and other parties pursuant to § 56-585.1 A 5 c of the Code of Virginia;
- Identifies several additional options available to obtain utility-specific or Virginia-specific data for use in estimating energy and demand savings attributable to the Company's current DSM programs and for consideration for application to future DSM programs;
- Recommends, at a minimum, that the Commission direct the Company perform billing or consumption analyses, as discussed by Staff witness Ferrell, to increase the rigor of the Company's current EM&V strategies which rely on deemed input variables from non-Virginia sources; and
- Recommends that the Commission provide guidance on which future proceeding will investigate the Company's filings for purposes of determining whether the energy savings targets contained within the VCEA have been met.

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[1] *Commonwealth of Virginia, ex rel., State Corporation Commission, Ex Parte: In the matter of baseline determination, methodologies for evaluation, measurement, and verification of existing demand-side management programs, and the consideration of a standardized presentation of summary data for Virginia Electric and Power Company*, Case No. PUR-2020-00156, Doc. Con. Cen. No. 200830148, Order Initiating Proceeding (Aug. 28, 2020) at 5-7.

[2] 2020 Va. Acts ch. 1193.

PRE-FILED TESTIMONY
OF
DAVID J. DALTON

VIRGINIA ELECTRIC AND POWER COMPANY

CASE NO. PUR-2020-00156

Q1. PLEASE STATE YOUR NAME AND POSITION WITH THE VIRGINIA STATE CORPORATION COMMISSION ("COMMISSION").

A1. My name is David J. Dalton and I am a Principal Utilities Analyst with the Commission's Division of Public Utility Regulation.

Q2. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A2. My testimony addresses Virginia Electric and Power Company's ("Dominion" or "Company") filing ("Initial Filing") in response to the Commission's questions contained in the Commission's Order Initiating Proceeding in the instant case[1] regarding the evaluation, measurement, and verification ("EM&V") of Dominion's currently approved and ongoing demand-side management ("DSM" or "energy efficiency") programs. Specifically, my testimony:

- Discusses the purpose and importance of EM&V;
- Addresses the Company's current EM&V strategies and methodologies and their compliance with the Commission's EM&V Rules;[2]

[1] *Commonwealth of Virginia, ex rel., State Corporation Commission, Ex Parte: In the matter of baseline determination, methodologies for evaluation, measurement, and verification of existing demand-side management programs, and the consideration of a standardized presentation of summary data for Virginia Electric and Power Company,* Case No. PUR-2020-00156, Doc. Con. Cen. No. 200830148, Order Initiating Proceeding (Aug. 28, 2020) at 5-7.

[2] 20 VAC 5-318-10 *et seq., Rules Governing the Evaluation, Measurement, and Verification of the Effects of Utility-Sponsored Demand-Side Management Programs* ("EM&V Rules").

- Discusses the implications on EM&V of statutory changes contained within the Virginia Clean Economy Act ("VCEA");[3]

- Discusses the creation of a summary "dashboard" for the presentation of the Company's EM&V results;

- Addresses the Company's responses to the Commission questions contained within its Order Initiating Proceeding in the instant case;

- Identifies several options available to obtain utility-specific or Virginia-specific measured and verified data for the Company's current DSM programs and for consideration for future DSM programs; and

- Includes several recommendations regarding how the Company's compliance with the energy savings targets contained within the VCEA should be investigated and provides several options for the Commission to consider for the appropriate proceeding to make determinations on this matter.

Background

Q3. PLEASE BRIEFLY SUMMARIZE THE BACKGROUND OF THE INSTANT CASE.

A3. The Commission adopted the EM&V Rules currently in effect in Case No. PUR-2017-00047.[4] The EM&V Rules provide multiple paths for compliance, ranging from using relatively more rigorous, utility-specific data, to a minimum compliance strategy relying on deemed values and estimates from regional technical reference manuals ("TRMs") or studies performed outside of Virginia. Although some customer-level data is used, Dominion has generally complied with the Commission's EM&V Rules using an

[3] 2020 Va. Acts ch. 1193.

[4] *Commonwealth of Virginia, ex rel., State Corporation Commission, Ex Parte: In the matter of Adopting New Rules Governing the Evaluation, Measurement, and Verification of the Effects of Utility-Sponsored Demand-Side Management Programs*, Case No. PUR-2017-00047, 2017 S.C.C. Ann. Rept. 489, Order Adopting Rules and Regulations (Nov. 9, 2017).

approach more aligned with the minimum requirements in each of its subsequent EM&V Reports.

In Case No. PUR-2019-00201 ("2019 DSM Case"),[5] the Commission found, among other things, that "more rigorous [EM&V] is necessary to ensure that the [Company's DSM] programs are, in *actual practice*, the proximate cause of a verifiable reduction in energy usage."[6] The Commission's Order Initiating Proceeding in the instant case identified the programs that will be considered in the proceeding[7] and directed the Company to provide at least the following information in the Company's Initial Filing:

1. Provide a summary, "dashboard" style format for reporting energy and demand savings (discussed on pages 16-17 of this testimony);

2. Provide the baseline the Company used in its analysis when initially proposing each program and measure, whether the Company now recommends changing this baseline, and why any change is recommended. For purposes of this case, the "baseline" is considered to be the expected energy or demand usage for an activity absent the DSM program or measure. (For example, what is the expected energy usage to illuminate a residential home without any incentive to purchase LED lightbulbs?) (discussed on pages 18-22 of this testimony);

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[5] *See Petition of Virginia Electric Power Company, For approval of its 2019 DSM Update pursuant to § 56-585.1 A 5 of the Code of Virginia*, Case No. PUR-2019-00201, Doc. Con. Cen. No. 200740067, Final Order (Jul. 30, 2020) ("2019 DSM Final Order").

[6] *Id.* at 18. Emphasis in the original.

[7] The instant case considers the following DSM programs: Phase I Residential AC Cycling Program; Phase II Non-Residential Distributed Generation Program; Phase IV Residential Income and Age Qualifying Home Improvement Program; Phase V Non-Residential Small Business Improvement Program; Phase VI Non-Residential Prescriptive Program; Phase VII Residential Appliance Recycling Program; Phase VII Residential Efficient Products Marketplace Program; Phase VII Residential Home Energy Assessment Program; Phase VII Non-Residential Lighting Systems & Controls Program; Phase VII Non-Residential Heating & Cooling Efficiency Program; Phase VII Non-Residential Window Film Program; Phase VII Non-Residential Small Manufacturing Program; Phase VII Non-Residential Office Program; Phase VIII Residential Energy Efficiency Kits Program; Phase VIII Residential Electric Vehicle Programs (EE and DR); Phase VIII Residential Electric Vehicle Program (Peak Shaving); Phase VIII Residential/Non-Residential Multi-Family Program; Phase VIII Residential New Construction Program; Phase VIII Residential Home Retrofit Program; Phase VIII Residential HB 2789 (Heating and Cooling/Health and Safety) Program; Phase VIII Residential Customer Engagement Program; Phase VIII Residential Smart Thermostat Management Programs (EE and DR); Phase VIII Residential Manufactured Housing Program; Phase VIII Non-Residential Midstream Energy Efficiency Products Program; Phase VIII Non-Residential New Construction Program; and Phase VIII Non-Residential Small Business Improvement Enhanced Program. Order Initiating Proceeding at 4-5.

3. Explain how the baseline was determined, the cost or estimated cost of determining the baseline, and whether the baseline is utility-specific or Virginia specific. If Virginia-specific, explain why a utility-specific baseline cannot be determined. If neither Virginia-specific nor utility-specific, explain why the recommended baseline is the best baseline to use for a given program or measure (discussed on pages 23-31 of this testimony);

4. For any recommended baseline that is not utility-specific, provide the projected cost of developing a utility-specific baseline, including options that consider varying levels of cost and detail. If Dominion believes it is impossible to develop a utility-specific baseline, explain this position in detail (discussed on pages 31-34 of this testimony);

5. Explain the method, including its cost or estimated cost, by which the Company planned to measure energy and demand savings when the Company proposed that program and/or measure, whether the Company's plans have changed, and why the change is recommended (discussed on pages 35-48 of this testimony);

6. State the order of preference (1, 2, or 3) listed in 20 VAC 5-318-40, *Minimum requirements for collection of evaluation measurement and verification data*, in which the Company's plan for measuring energy and demand savings for each program or measure falls. If the Company's plan for measuring savings falls within category 2 (data that is Virginia-specific but not utility-specific) or category 3 (data from non-Virginia jurisdictions and sources), provide a detailed explanation why a plan that would fall under category 1 (utility-specific data) is not being recommended (discussed on pages 48-56 of this testimony);

7. For any program or measure in which the Company's plans to measure savings falls within category 2 or 3, provide the projected cost of obtaining category 1 (utility-specific) data at multiple levels of cost and statistical rigor (discussed on pages 56-65 of this testimony); and

8. If the Company believes it is impossible to collect actual data to measure energy or demand savings for a specific program or measure, explain in detail why such is the case, bearing in mind that, as a general rule, "deemed savings" is the least preferable way to measure energy savings according to 20 VAC 5-318-40 (discussed on page 65 of this testimony).

The Company's responses to these directives and questions will be discussed at length later in this testimony.

Discussion of EM&V and the Commission's EM&V Rules

Q4. WHAT IS THE PURPOSE OF EM&V?

A4. As the Commission has stated in a number of orders, the primary purpose of EM&V is to ensure that programs and measures are, *in actual practice*, the proximate cause of verifiable reductions in energy usage.[8] In other words, EM&V should be designed to allow the Commission to ascertain whether the project is providing the expected or designed levels of savings, as represented in the petition requesting approval of the programs. Additionally, accurate EM&V can provide information to refine future program designs. To the extent an existing program is found to not be performing as planned, accurate EM&V may provide valuable information for modifications or improvements to the program or similar future programs.

Q5. WHEN DID THE COMMISSION'S CURRENT EM&V RULES BECOME EFFECTIVE?

A5. The Commission's current EM&V Rules became effective January 1, 2018. The EM&V Rules are applicable to all electric and natural gas public utilities seeking Commission approval to implement or renew DSM programs or measures. Staff notes that, due to the timing of implementation of the EM&V Rules, only the Company's Phase VII and Phase VIII programs were submitted for, and received, approval pursuant to the Commission's EM&V Rules.

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[8] *See, e.g.*, 2019 DSM Final Order at 18; *Petition of Virginia Electric and Power Company, For approval to implement demand-side management programs and for approval of two updated rate adjustment clauses pursuant to § 56-585.1 A 5 of the Code of Virginia*, Case No. PUR-2018-00168, 2019 S.C.C. Ann. Rept. 285, 288, Order Approving Programs and Rate Adjustment Clauses (May 2, 2019) ("2018 DSM Order").

Q6. HAVE THERE BEEN ANY CHANGES TO THE CODE OF VIRGINIA ("CODE") SINCE THE COMMISSION IMPLEMENTED THE EM&V RULES?

A6. Yes. During the 2018 legislative session, the Virginia General Assembly passed the Grid Transformation and Security Act of 2018 ("GTSA").[9] The GTSA amended several sections of the Code relevant to utility-offered DSM programs and the cost recovery thereof. Enactment Clause 15 of the GTSA directed Dominion to propose at least $870 million in new expenditure on energy efficiency or DSM programs between July 1, 2018, and July 1, 2028.[10]

During the 2020 legislative session, the Virginia General Assembly passed the VCEA, which amended several sections of the Code relevant to DSM programs and the cost recovery thereof. Relevant to this proceeding, the VCEA amended Code §§ 56-585.5, 56-585.1, and 56-596.2.[11]

Q7. DOES THE VCEA ESTABLISH ANNUAL TARGETS FOR REDUCTIONS IN TOTAL ENERGY SALES?

A7. Yes. Code § 56-596.2 B states, in part:

> B. Notwithstanding any other provision of law, each investor-owned incumbent electric utility shall implement energy efficiency programs and measures to achieve the following total annual energy savings:
>
> ...
>
> 2. For Phase II electric utilities:

[9] 2018 Va. Acts ch. 296.

[10] *Id.*

[11] Enactment Clause 15 of the GTSA was subsequently amended by the VCEA and codified as Code § 56-596.2 A and C.

a. In calendar year 2022, at least 1.25 percent of the average annual energy jurisdictional retail sales by that utility in 2019;

b. In calendar year 2023, at least 2.5 percent of the average annual energy jurisdictional retail sales by that utility in 2019;

c. In calendar year 2024, at least 3.75 percent of the average annual energy jurisdictional retail sales by that utility in 2019; and

d. In calendar year 2025, at least 5.0 percent of the average annual energy jurisdictional retail sales by that utility in 2019; and

3. For the time period 2026 through 2028, and for every successive three-year period thereafter, the Commission shall establish new energy efficiency savings targets. In advance of the effective date of such targets, the Commission shall, after notice and opportunity for hearing, initiate proceedings to establish such targets. As part of such proceeding, the Commission shall consider the feasibility of achieving energy efficiency goals and future energy efficiency savings through cost-effective programs and measures.

Q8. HOW IS EM&V RELEVANT TO THESE PROVISIONS?

A8. In addition to the Commission's prior finding that more rigorous EM&V is necessary to ensure that programs are, in actual practice, the proximate cause of verifiable reductions in energy usage, increased rigor in the EM&V will give all interested parties, including the Commission and the General Assembly, confidence in the savings estimates provided toward compliance with the reduction targets required by the VCEA.

More rigorous EM&V will also allow the Commission to develop realistic energy efficiency savings targets and to more accurately consider the feasibility of these targets.

Q9. HOW MIGHT MORE RIGOROUS EM&V ASSIST THE COMMISSION IN ESTABLISHMENT OF FUTURE ENERGY EFFICIENCY SAVINGS TARGETS?

A9. On advice of counsel, it does not appear that the Code provides for any specific methodology for the Commission to use in its formulation of new energy savings targets.[12] Staff believes that it would be preferable to have reliable measurements of the energy saved in prior years to inform the Commission's decisions in establishing future energy efficiency savings targets. Accurate EM&V data may also inform the Commission's determinations regarding the feasibility of the Company achieving these energy efficiency savings targets.

Q10. DOES THE VCEA INCLUDE ANY FINANCIAL INCENTIVES FOR THE COMPANY TO ACHIEVE THE ENERGY EFFICIENCY SAVINGS TARGETS?

A10. Yes. Code § 56-585.1 A 5 c states, in part:

> Prior to January 1, 2022, the Commission shall award a margin for recovery on operating expenses for energy efficiency and pilot programs, which margin shall be equal to the general rate of return on common equity determined as described in subdivision 2. Beginning January 1, 2022, and thereafter, if the Commission determines that the utility meets in any year the annual energy efficiency standards set forth in § 56-596.2, in the following year, the Commission shall award a margin on energy efficiency program operating expenses in that year, to be recovered through a rate adjustment clause, which margin shall be equal to the general rate of return on common equity determined as described in subdivision 2.

Put simply, if the Commission determines that, in a given year, the Company meets the energy efficiency savings targets discussed above, the Company will be able to collect a margin on its expenditure on energy efficiency programs for that year. Further, the Company can earn a bonus profit margin of an additional 20 basis points for each additional

[12] Staff notes that the targets set forth in the Code increase by 1.25% annually for the years 2022-2025.

incremental 0.1% in annual energy efficiency savings beyond the annual requirements.[13] In Staff's view, this new statutory requirement and allowance for additional margin recovery further underscores the importance of accurate EM&V.

Q11. HOW MAY THE LEVEL OF RIGOR IN EM&V IMPACT POTENTIAL MARGINS TO BE EARNED BY THE COMPANY?

A11. There is a relationship between rigor and accuracy. Less rigorous EM&V will necessarily be less accurate. This may allow the Company to more easily report savings that *potentially* achieve the energy efficiency savings targets, albeit with a commensurate reduction in the level of confidence in the accuracy of the estimate. In contrast, increased levels of rigor will lead to more accuracy, thus enhancing confidence that the Company is, *in actual practice*, experiencing the energy savings reported for compliance with the energy efficiency savings targets. Thus, higher levels of rigor, and accuracy, would serve to inform the Commission's determination as to whether the Company has met the savings targets and is permitted to recover a margin on operating expenses for its energy efficiency programs. This relationship between rigor and accuracy is also reflected in the hierarchy contained in the Commission's EM&V Rules, with utility-specific data considered to be superior to and more accurate than Virginia-specific data, and Virginia-specific data considered to be superior to and more accurate than deemed values and assumptions from TRMs or studies performed in jurisdictions other than Virginia.

[13] Code § 56-585.1 A 5 c.

Q12. DOES THE VCEA INCLUDE ANY OPERATIONAL INCENTIVES FOR THE COMPANY TO ACHIEVE THE ENERGY EFFICIENCY SAVINGS TARGETS?

A12. Yes. Code § 56-585.1 A 5 c also states, in part:

> Notwithstanding any other provision of law, unless the Commission finds in its discretion and after consideration of all in-state and regional transmission entity resources that there is a threat to the reliability or security of electric service to the utility's customers, the Commission shall not approve construction of any new utility-owned generating facilities that emit carbon dioxide as a by-product of combusting fuel to generate electricity unless the utility has already met the energy savings goals identified in § 56-596.2 and the Commission finds that supply-side resources are more cost-effective than demand-side or energy storage resources.

In other words, if the Commission determines that the Company has not met the energy efficiency savings targets discussed above, the Company would be precluded from constructing generating units that emit carbon dioxide as a by-product of fuel combustion, absent a threat to reliability or security of electric service to the Company's customers. Once again, this change in statutory language emphasizes the importance of rigorous and accurate EM&V.

Q13. HOW MAY THE LEVEL OF RIGOR OF EM&V AFFECT THE COMPANY'S ABILITY TO BUILD CARBON-EMITTING RESOURCES?

A13. Less rigorous EM&V, because it is less accurate, may allow the Company to more easily report energy efficiency savings that *potentially* meet or exceed the targets envisioned by the VCEA, albeit with a low level of confidence. The easier it is to achieve the energy efficiency savings targets contained within the VCEA, the less difficult it may be for the Company to receive approval to build carbon-emitting generation resources.

Alternatively, more rigorous EM&V, which yields more accurate results of the Company's *actually achieved* energy savings, would more fully inform the Commission's determination should the Company seek approval to build carbon-emitting generating units in the future.

Q14. DOES THE VCEA IMPOSE ANY ENERGY EFFICIENCY REPORTING REQUIREMENTS ON THE COMMISSION?

A14. Yes. First, Code § 56-585.1 A 5 c requires that the Commission annually monitor and report to the General Assembly the performance of all programs approved pursuant to Code § 56-585.1 A 5, including:

- The Company's compliance with the total annual savings required by Code § 56-596.2;
- Annual and lifecycle net and gross energy and capacity savings;
- Related emissions reductions and other quantifiable benefits;
- Total customer bill savings produced by the programs;
- Utility spending on each program, including associated administrative costs; and
- Each utility's avoided costs and cost-effectiveness results.

Code § 56-596.2 B 3 requires that the Commission annually review the feasibility of the energy efficiency program savings targets and report to the Chairs of the House Committee on Labor and Commerce, the Senate Committee on Commerce and Labor, the Secretary of Natural Resources, and the Secretary of Commerce and Trade on such feasibility, beginning October 1, 2022.

Q15. HOW WOULD MORE RIGOROUS EM&V AFFECT THESE REPORTING REQUIREMENTS?

A15. More rigorous EM&V would provide more accurate results. The Commission could then report its findings with a higher degree of confidence that the Company has, *in actual practice*, achieved the savings reported.

Q16. ARE THERE OTHER CODE SECTIONS THAT AFFECT OR MAY BE AFFECTED BY ENHANCED RIGOR IN EM&V?

A16. Yes. The VCEA, in Code § 56-585.5 C, establishes a mandatory Virginia Renewable Portfolio Standard Program ("RPS Program"). The RPS Program, among other things, establishes annual goals for the sale of renewable energy to all retail customers in the Company's service territory, with limited exceptions,[14] regardless of whether those customers purchase electric supply service from the Company or third-parties. The Company may use renewable energy certificates ("RECs") purchased from non-utility renewable generators for compliance with the RPS Program. Finally, the RPS Program, among other things, sets a timeline by which the Company is required to propose certain quantities of renewable energy generating resources.[15]

Q17. HOW MIGHT THE RPS PROGRAM BE AFFECTED BY MORE RIGOROUS EM&V?

[14] Code § 56-585.5 G provides the categories of customers exempt from RPS compliance.

[15] Code § 56-585.5 D.

A17. Energy efficiency programs and measures are intended to reduce the Company's total energy sales. To the extent this occurs, the Company would need to generate, from its renewable generation portfolio, or acquire, through market purchases, fewer RECs to comply with certain requirements of the RPS Program. In theory, if significant energy efficiency savings were to occur, the Company may even be able to avoid the need for a future generating resource. Thus, energy savings achieved through energy efficiency programs and measures could result in lower RPS compliance costs to be recovered from customers.

Q18. CAN STAFF PROVIDE AN ILLUSTRATIVE EXAMPLE OF THIS?

A18. Yes. Staff offers the following simplified example for consideration:

- The Company sells 10 megawatt-hours ("MWh") of energy annually;
- The Company generates 1 MWh of energy from solar generation and the remaining 9 MWh from non-nuclear generation;
- The RPS Program requires that 20% of the 10 MWh of energy sales must come from renewable energy sources or have a REC retired for it;
- The Company must retire 2 RECs to meet the 20% requirement.

In this simple example, the Company must purchase one REC from the market to comply with the RPS Program.

If, however, an energy efficiency program that saves 5 MWh per year were introduced, annual sales would fall to 5 MWh. All else held constant in the above example, the 1 MWh of solar generation, and the associated REC, would be sufficient for RPS Program compliance. Thus, the Company's customers would see a reduction in their RPS Program compliance costs.

Q19. HOW COULD THE LEVEL OF EM&V RIGOR IMPACT THE COMPANY'S RPS PROGRAM COMPLIANCE?

A19. As previously stated, the goal of energy efficiency is to reduce the amount of energy consumed by the customer. This will result in reductions to the Company's energy sales. However, without measuring and verifying that, in actual practice, the energy efficiency measures and programs are the proximate cause of a reduction in energy usage, it is impossible to determine whether the customer saved the claimed energy or if the Company's sales were actually reduced, as a result of the energy efficiency program, by a proportionate amount or not. A higher level of EM&V rigor would result in more reliable savings estimates and provide more certainty about reported energy efficiency savings.

Q20. HOW COULD THIS INTERPLAY BETWEEN ENERGY EFFICIENCY AND THE RPS PROGRAM AFFECT THE COMPANY'S CUSTOMERS?

A20. Both the costs of RPS Program compliance and DSM are recovered from the Company's customers. In the above example, if the Company introduces an energy efficiency program that does not, in actual practice, reduce the Company's energy sales by 5 MWh, then the Company will necessarily need to procure one additional REC to cover the energy sales not reduced. In this case, customers have paid for the energy efficiency program that was expected to reduce sales by 5 MWh, the 5 MWh of replacement energy (or a portion thereof) that was not reduced, and the REC to cover the sale that was not avoided in actual practice. If the energy savings are not realized, essentially, the customer would pay twice – first for the cost of the energy efficiency programs, including a profit margin to the Company based on the reported, but not actually achieved, energy efficiency savings, and

again for the actual energy consumption and associated RPS Program compliance costs due to the lack of actual energy savings achieved.

Q21. DOES STAFF HAVE ANY COMMENTS REGARDING THE ENHANCED IMPORTANCE OF EM&V AND THE COMMISSION'S EM&V RULES?

A21. As mentioned previously, the Commission's EM&V Rules were developed in a period prior to these substantial legislative developments. The EM&V Rules were designed to allow for varying levels of rigor, from less rigorous (use of data from jurisdictions other than Virginia) to more (use of utility-specific data), at varying costs (less costly to more, respectively) to allow flexibility for utilities to develop EM&V strategies and methodologies while providing the Commission with reasonable estimations of energy and demand savings resulting from DSM programs.

Given the enhanced importance of accurate EM&V data, including compliance with provisions within the VCEA and the Commission's 2019 DSM Final Order, Staff believes that it may be appropriate to revisit the EM&V Rules and revise them to increase the minimum requirements for appropriate levels of rigor for future DSM proposals. The current minimum requirements may be sufficient for approval of a DSM program, however, it is likely not sufficient for satisfying the energy efficiency reduction targets contained in the VCEA.

Commission Questions

Commission Question 1 - Dashboard

Q22. DID THE COMPANY PRESENT A "DASHBOARD" STYLE FORMAT FOR REPORTING ENERGY AND DEMAND SAVINGS?

A22. Yes. The Company provides a draft dashboard format, developed from Environmental Witness Grevatt's testimony in Case No. PUR-2019-00201, presented in his Attachment JG-3.[16] The draft dashboard is presented on page 53 in Section 3.4 of the Initial Filing's EM&V Background & Information Report and is reproduced in Figure 1, below, for convenience:

Figure 1: Company's Proposed Draft Dashboard Format

		2021				
Phase	Program	Participants	Net Annual Energy Savings (MWh)	Net Lifetime Energy Savings (MWh)	Capacity Savings (MW)	Budget
VIII	Res. EV EE					
VIII	Res. EV DR Peak Shaving					
VIII	Res. EE Kits					
VIII	Res. Home Retrofit					
VIII	Res. Manufactured Housing					
VIII	Res. NC					
VIII	Res. MF					
VIII	Non-Res. MF					
VIII	Non-Res Midstream EE					
VIII	Non-Res NC					
VIII	Small Biz Enhancement					
VIII	HB 2789					
VIII	Total Res.					
VIII	Total Non-Res.					

[16] Initial Filing, EM&V Background & Information Report at 52.

The Company also states that DNV GL, the Company's EM&V contractor, is prepared to provide the contents of the EM&V report in a dashboard developed through a stakeholder process.[17]

Q23. DOES STAFF HAVE ANY PROPOSED MODIFICATIONS TO THE DRAFT DASHBOARD FORMAT?

A23. Yes. Staff appreciates the Company's effort in developing the draft dashboard. Staff does, however, recommend several modifications to the dashboard format. As discussed above, the VCEA requires the Commission to annually report to the General Assembly the performance of all programs approved, including each utility's compliance with the total annual savings, annual and lifecycle net and gross energy and capacity savings, related emissions reductions, and "other quantifiable benefits of each program"; total customer bill savings that the programs produce; utility spending on each program, including administrative costs; and each utility's avoided costs and cost-effectiveness results.[18] The Company's response to Staff Interrogatory No. 3-24 states that the Company's current level or levels of EM&V allow the Company to provide this information in future EM&V reports.[19] Staff recommends that the dashboard format include at least the information that the Commission is required to report to the General Assembly, in addition to whatever other information is found to be appropriate, to enhance transparency and allow all interested parties to easily find and review it.

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[17] *Id.*

[18] Code § 56-585.1 A 5 c.

[19] *See* the Company's response to Staff Interrogatory No. 3-24. Unless otherwise noted, all interrogatory responses referenced herein are included in Attachment No. DJD-1.

Commission Question 2 – Provide the Baseline When Programs Were Proposed

Q24. DID THE COMPANY PROVIDE THE BASELINES USED IN ITS ANALYSIS WHEN INITIALLY PROPOSING EACH PROGRAM AND MEASURE?

A24. Not as part of its Initial Filing. Company witness Frost states, on page 2 of his Direct Testimony, that Column G of Appendix A[20] of the EM&V Background & Information Report, submitted as part of the Company's Initial Filing, addresses planning baselines for the Company's DSM programs.[21] The referenced column of Appendix A simply provides a high-level explanation of the source for the planning assumption, which Staff notes in all cases appears to be "Provided by program designer," and a reference to the Case Number in which the Company filed for approval of the program. The specific planning-level baselines, however, are not included in the referenced column. Staff reviewed several of the referenced cases and was unable to locate, in the formal records of such cases, the baseline assumptions utilized for each program or measure as initially proposed.

The Company's response to Staff interrogatory No. 6-62 included the following attachments:

- Attachment Staff Set 6-62 (1) (MTH) provides information for the Phase IV Income and Age Qualifying Home Improvement Program;
- Attachment Staff Set 6-62 (2) (MTH) provides information for the Phase VI Non-Residential Prescriptive Program;

[20] Staff notes that on January 13, 2021, the Company filed an errata filing amending Appendix A, which edited several of the items in the column labeled "EM&V Baseline Efficiency Factor" and added a column that provides an explanation of the edits. Staff will refer to the errata filing as "Appendix A" for purposes of this testimony.

[21] Column G is titled "Planning Baseline." Staff notes there is also a column labeled "EM&V Baseline Efficiency Factor," which the Company's response to Staff Interrogatory No. 6-61 identifies as the baseline efficiency parameter identified in the STEP Manual for each measure. The Company states that it is a "deemed factor" as defined on page 6 in section 2.1.3 of the EM&V Background & Information Report, which will be discussed at greater length later in this testimony.

- Attachments Staff Set 6-62 (3) (MTH) through 6-62 (11) (MTH) provide information for the Phase VII Programs, with the exception of the Phase VII Residential Appliance Recycling Program, for which energy and demand savings were derived from historical information obtained through the Company's Phase IV Appliance Recycling Program;[22]

- Extraordinarily Sensitive Attachment Staff Set 6-62 (12) (MTH), Confidential Attachments Staff Set 6-62 (13) (MTH) and 6-62 (14) (MTH), and Attachments Staff Set 6-62 (15) (MTH) through 6-62 (29) (MTH) provide information for the Company's Phase VIII Programs.[23]

The Attachments provided along with the Company's response to Staff Interrogatory No. 6-62, in Staff's opinion, do not fully respond to the Commission's question. Specifically, several of the attachments appear to include explicit identification of the assumed baseline inputs utilized at the time of proposal,[24] while other attachments appear to only implicitly include the baselines in the calculated assumed savings presented therein.[25] For the sheets that only provide calculated energy savings and do not explicitly identify the baseline inputs used at the time of filing, it appears, generally, that the sources of the baseline inputs are provided as relevant TRMs.[26]

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[22] Information for the Company's Phase IV Appliance Recycling Program was presented in Appendix A of the Company's Evaluation, Measurement, and Verification Report for Virginia Electric and Power Company, dated May 1, 2018, filed in Case No. PUE-2016-00111. Due to the voluminous nature of the referenced Appendix A, it is not attached to this testimony. Staff has maintained a physical copy of the referenced information and can provide it upon request.

[23] Attachments Staff Set 6-62 (1) (MTH) through 6-62 (29) (MTH) are included in Extraordinarily Sensitive Appendix 1 (on compact disc). The Company's corrected response to Staff Interrogatory No. 6-62 (a), included in Attachment No. DJD-1, clarified that only 29 attachments were included in the response rather than the originally-stated 30.

[24] *See, e.g.*, Attachment Staff Set 6-62 (2) (MTH), tab "DATA – IceMach spec," Column D.

[25] *See, e.g.*, Attachment Staff Set 6-62 (11) (MTH).

[26] *Id.*

The Company's response to Staff Interrogatory No. 6-62 also states that no baselines were included for the Phase V Small Business Improvement Program because it is closed.

Company witness Frost states that, historically, the Company has used the planning assumptions – including baselines and savings projections – from the program designers for purposes of cost/benefit modeling in the respective DSM filings.[27] After approval, however, the measures were then provided to DNV GL for independent review and determination of the appropriate EM&V baselines for each measure, "irrespective of what was assumed at the planning stage."[28] Company witness Frost notes that in Dominion's rebuttal in the 2019 DSM Case, the Company acknowledged that this methodology "can sometimes cause a disconnect between projected and reported program savings."[29] The Company's response to Staff Interrogatory No. 11-133 states that, as a result, DNV GL now receives information regarding program design prior to the Company's filing for the program and identifies specialized data required to conduct EM&V and that should be considered in the program design.

Staff recommends that the Commission direct the Company to document the baseline assumptions utilized during program design and all subsequent adjustments or changes to the baselines and provide this documentation, upon request, to Staff and other interested parties.

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[27] Direct Testimony of Company witness Nathan J. Frost ("Frost Direct") at 5-6.

[28] *Id.* at 6.

[29] *Id.*

Q25. DID THE COMPANY IDENTIFY WHETHER IT RECOMMENDS CHANGING BASELINES AND PROVIDE AN EXPLANATION FOR WHY SUCH CHANGES ARE RECOMMENDED?

A25. The Company did not specifically identify, for each measure or program, whether the baseline assumptions had changed. Company witness Frost provides a general explanation of the possible changes, and reasons therefor, that may occur between planning-level baseline assumptions provided by the program designers and those used by DNV GL in EM&V of the measures and programs.[30] The Company's response to Staff Interrogatory No. 6-62 also states that, during the process of developing baselines for EM&V after program approval, "there are naturally occurring updates that are made...to include updates to the baseline and any other aspects of that deemed saving method." The response continues that this occurs because, following program approval, DNV GL begins research to develop the STEP Manual, where the baseline is then set for savings tracking calculations, which may result in changes to baseline assumptions used at the time of proposal. DNV GL develops and updates the STEP Manual to reflect the most-recently available information annually.[31]

Generally, Staff notes that the STEP Manual, Version 10, which is provided as Appendix C to the EM&V Background and Information Report, documents the changes from the prior version of the STEP Manual of all variables used in calculating the energy and demand savings estimates attributable to the program, including baseline assumptions. The STEP Manual also documents the reasons for these changes. Staff also notes,

[30] *See id.* at 5-6.

[31] *Id.*

however, this does not document the planning-level baselines used at the time of proposing the programs, as Company witness Frost states that the EM&V baselines have not historically been developed by DNV GL until after program approval. Company witness Frost states that this has been identified as an area that can be improved moving forward and that DNV GL now reviews program savings assumptions provided by the implementation vendor "earlier in the planning process and prior to filing for Commission approval" to identify potential areas where data provided by program designers may not align with DNV GL's data.[32] Company witness Frost states that projected savings can then be adjusted to more closely compare to what DNV GL may expect to use for purposes of its own evaluation.[33] Staff agrees that more coordination and communication between DNV GL and the program designer(s) is desirable given that the baseline assumptions are a critical driver of energy efficiency savings estimates and that the Commission relies on the planning-level baseline estimates when each program is approved.

At the time of this writing, Staff was not able to verify individual changes to the baseline assumptions provided at the time of proposal of each program or whether the Company has provided individual explanations for each such change. Staff recommends that the Commission direct the Company to document all revisions to all inputs since the time of proposal and provide these documented changes upon request.

[32] Frost Direct at 6.

[33] *Id.*

Question 3 – How Baselines Were Determined, Costs of Baseline Determination, and EM&V Rules Order of Preference

Q26. DID THE COMPANY EXPLAIN HOW THE BASELINES WERE DETERMINED?

A26. As stated previously, Appendix A of the EM&V Background and Information Report states that the program designer provided baselines used when the programs were proposed. The baselines used for conducting EM&V and their sources were developed by DNV GL and are provided in the column titled, "EM&V Baseline Efficiency Factor." These EM&V baselines largely come from applicable federal or State minimum requirements (such as building code or efficiency requirements); however there are also several that cite to customer applications, technical reference manuals (most commonly the Mid-Atlantic Technical Reference Manual), and independent studies referenced in technical reference manuals.[34] The baselines determined by DNV GL for the Phase III through VII programs are included in the STEP Manuals, attached to the EM&V Background & Information Report as Appendix C. A general description of the types of baselines to be determined by DNV GL for the Phase VIII programs is provided in Appendix E of the EM&V Background & Information Report.

The Company's response to Staff Interrogatory No. 5-38 states that the STEP Manual for the Company's Phase VIII Programs and the input variables used in calculating energy and demand savings, are "still being finalized." This would include, necessarily, the baseline assumptions for the Phase VIII Programs. Page 38 of the EM&V Background & Information Report states that more detailed information than is currently available will be included in the 2021 EM&V Report, which is due to be filed with the Commission on

[34] EM&V Background & Information Report, Appendix A, pages 1-9.

or before May 15, 2021. The Company's response to Staff Interrogatory No. 2-20 states that the Phase VIII Program information will not be available until the filing of the Company's 2022 EM&V Report.

Q27. DID THE COMPANY PROVIDE THE COST OR ESTIMATED COST OF DETERMINING THE PROGRAM AND MEASURE BASELINES IN ITS INITIAL FILING?

A27. No, it did not. However, the Company's response to Staff Interrogatory No. 6-63 (a), provided by Company witness Hubbard, states that because planning baselines are developed by each program designer as part of their response to a request for proposal, the Company does not incur a specific cost for the baseline determinations at the time of proposal. The response continues that, should the program designer's proposal be selected by the Company, the cost of developing its baseline may be included in the cost of implementation, but the Company does not pay a specific cost for the development of baselines used at the time of program proposal and does not possess itemized cost information associated with proposal development incurred by each program designer.

In response to Staff Interrogatory No. 4-27 (c), the Company stated, "The exact costs of determining the baseline cannot be parsed out from the entirety of the STEP Manual annual research and update activities...." The response continues that, in total, the research and updating of the STEP Manual cost approximately **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]**. The Company's response to Staff Interrogatory No. 6-63 also states that the baselines utilized by DNV GL for purposes of EM&V are developed as part of the larger EM&V work performed and that the Company does not have itemized costs associated with this

specific task. The Company's Extraordinarily Sensitive response to Staff Interrogatory No. 6-63, provided by Company witness Feng, also states that DNV GL is unable to separate the costs associated with development of the baselines as "that level of time account is not currently being done, nor would it be prudent to do."

Thus, the Company was not able to be fully responsive to the Commission's specific question. It is unclear to Staff if the Company's explanation is sufficient to satisfy the Commission's specific question on this matter.

Q28. DID THE COMPANY IDENTIFY WHETHER THE BASELINES ARE UTILITY-SPECIFIC OR VIRGINIA-SPECIFIC?

A28. Section 3.1.1 of the EM&V Background & Information Report provides a high-level explanation of what category the Company believes its baselines fall into in Table 3-1.[35] For convenience, Table 3-1 is reproduced below:

[35] EM&V Background & Information Report, Section 3.1.1, beginning on page 38.

Table 3-1: Dominion energy baseline assignment approach, and baseline data sources		
Event Type	**Baseline Type**	**Baseline Data Source (Utility-specific, Virginia Specific, or Other)**
Early replacement or retrofit of functioning equipment still within its current useful life*	Existing condition or dual baseline	Customer-specific[36] and utility-specific
Replace on failure or at end of useful life, or beyond rated useful life	Codes and standards – if available or applicable technology, measure and parameter (*e.g.*, heat pump SEER value from most recent Federal Appliance Standard)	Utility-specific and Virginia-specific
	Common practice (new purchase) – if applicable codes are not available and existing data is inconsistently available and/or of unreliable quality (*e.g.*, nameplate data is unreadable, customer cannot be relied upon to know the product specification details to be able to provide it)	A mixture of utility-specific, Virginia-specific, and other depending on the measure and particular parameter
Process Improvements (*e.g.*, retro-commissioning / recommissioning)	Existing condition or common practice (existing stock) – if applicable codes are not available and preexisting data is consistently available and of reliable quality	A mixture of utility-specific, Virginia-specific, and other depending on the measure and the particular parameter
New Construction and substantial existing building improvements	Codes and standards – if available for applicable technology, measure, and parameter (*e.g.*, heat pump SEER value from most recent Federal Appliance Standard)	Utility-specific and Virginia-specific
	Common practice (new installations) – if applicable codes are not available and existing data is inconsistently available and/or of unreliable quality (*e.g.*, nameplate data is unreadable, customer cannot be relied upon to know the product specification details to be able to provide it)	A mixture of utility-specific, Virginia-specific, and other depending on the measure and the particular parameter
Non-equipment based programs (*e.g.*, behavioral-based and training programs	Existing conditions	Customer-specific
Peak Shaving	Existing conditions (conditions absent the peak shaving)	Customer-specific
*Up until now, no Dominion EE measures have been treated as early replacement. The baselines indicated for this category are under consideration for the future.		

[36] The Company defines "customer-specific" data as including data originating from either the customer application forms collected directly from the customer or by the installation contractor, or reliable third-party sources (*e.g.*, U.S. Census or local tax databases). The Company considers customer-specific information as a more specific subset of utility-specific information. EM&V Background & Information Report, Section 2.1.6, page 17.

The Company's Extraordinarily Sensitive response to Staff Interrogatory No. 6-63, Attachment Staff Set 63(b) (DF)_Utility_VA_specific provides the Company's classification as utility-specific, Virginia-specific, or other for the baselines as presented in Appendix A of the EM&V Background & Information Report.[37] Based on Attachment Staff Set 63(b) (DF)_Utility_VA_specific, there are 235 total baselines identified in the attachment. Of these, 89 are labeled as utility-specific, 106 are Virginia-specific, and 40 are from non-utility, non-Virginia sources.[38] The EM&V Background & Information Report, in Section 2.1.6, states that DNV GL considers Virginia-specific and utility-specific data to be synonymous.[39]

Q29. DOES STAFF HAVE ANY COMMENT REGARDING THE CLASSIFICATION OF BASELINES AS UTILITY-SPECIFIC, VIRGINIA-SPECIFIC, OR FROM NON-VIRGINIA JURISDICTIONS?

A29. Yes. As shown in its response to Staff Interrogatory No. 6-63, Attachment Staff Set 63(b) (DF)_Utility_VA_specific, the Company believes that Federal appliance and equipment standards and state building codes qualify as at least Virginia-specific data. According to Section 2.1.6, the Company further believes that this data is, necessarily, utility-specific data. Staff does not agree. While Staff acknowledges that the baselines would not be **below** these codes or standards in the Company's service territory, Staff is concerned that the actual baselines of the Company's customers, or "utility-specific" baselines, may be

[37] Staff notes that Attachment Staff Set 63(b) (DF)_Utility_VA_specific is not marked as Extraordinarily Sensitive.

[38] Staff is including data labeled "Combination of utility- and Virginia specifi [sic] and other" in the "Data Source" column as "other" for purposes of its analysis.

[39] EM&V Background & Information Report at 15.

above these codes or standards, even absent energy efficiency programs. As such, should the Commission desire more rigorous and thorough development of baselines against which to measure savings attributable to energy efficiency standards, Staff recommends that the Company be directed to conduct appropriate baseline studies to determine the appropriate baselines its customers actually have.

Q30. CAN STAFF PROVIDE AN EXAMPLE DEMONSTRATING ITS CONCERNS?

A30. Yes. The current minimum seasonal energy efficiency ratio ("SEER") for an air conditioning heat pump in the southeast – including Virginia – is a rating of 14.[40] While this may be the baseline unit that customers, absent incentives, would install in Virginia or within the Company's service territory, a baseline study may reveal that even absent utility-sponsored programs, the Company's customers or Virginians generally choose to install heat pumps above the minimum requirements. The Company's response to Staff Interrogatory No. 7-85 states that the Company has not performed any studies supporting the use of codes and standards baselines and the Company's response to Staff Interrogatory No. 7-86 states that the Company is not currently planning to undertake these types of studies. Staff notes that the Company's response to Staff Interrogatory No. 4-27 states, in part, that by following its "value of information framework," DNV GL has determined that Company-specific baseline studies would be unlikely to yield utility-specific baselines that are significantly different than what is currently used. Essentially, the Company assumes

[40] From: United States Energy Information Administration, "Efficiency requirements for residential central AC and heat pumps to rise in 2023," July 30, 2019, from https://www.eia.gov/todayinenergy/detail.php?id=40232#:~:text=The%20new%20standards%20effective%20in,are%20a%20larger%20share%20of, accessed March 17. A printout of this webpage is included in Attachment No. DJD-2.

that its assumptions are correct without actually *verifying* these assumptions. Staff does not believe the judgment of the Company's consultant is satisfactory for the Commission to reach a finding of fact that such baselines are *verified.* Further, Staff does not believe the judgment of the Company's consultant can substitute for the Commission's judgment. Thus, Staff remains concerned about whether the Company's currently assumed baselines, including those developed only from codes and standards, accurately represent its customers' actual baselines.

The adequacy of the baselines is, ultimately, a matter of discretion for the Commission; however, Staff believes further Commission guidance as to the level of rigor and subsequent level of accuracy used in the development of baselines is needed in the instant case.

Q31. DOES STAFF HAVE FURTHER COMMENTS REGARDING THE BASELINES PRESENTED IN APPENDIX A TO THE EM&V BACKGROUND & INFORMATION REPORT?

A31. Yes. For measures or programs involving new construction, the Company states that federal or Virginia code requirements represent the baselines against which savings will be estimated. Staff maintains its concerns raised in the Company's 2019 DSM Case regarding the appropriateness of these baselines.[41] Specifically, for the Phase VIII Residential New Construction Program, Staff continues to have concerns regarding the appropriateness of

[41] *See* 2019 DSM Case, Direct Testimony of David J. Dalton ("2019 Dalton Direct"), Doc. Con. Cen. No. 200330219 (Mar. 27, 2020) at 41-43. Staff notes that the webpages referenced therein are no longer available but are printed and attached to that testimony in Attachment No. DJD-7. The referenced pages of 2019 Dalton Direct and Attachment No. DJD-7 are included in Attachment No. DJD-3.

the assumption that, absent the program, new homes built within the Company's service territory would be built only to the minimum building code energy efficiency requirements. Staff believes the appropriate baseline for residential new construction is the builder-specific minimum construction energy efficiency rating, by model type, rather than the Virginia code minimum. Simply put, different builders currently provide a variety of homes with varying degrees of energy efficiency considerations. Although a subset of these homes may be built to the minimum energy efficiency requirements, it is unlikely that 100% of the homes are built to these minimum standards. The appropriate baseline should be the *average* of the homes being built, which will necessarily be a higher standard than the code minimum energy efficiency requirements.

Q32. CAN YOU PROVIDE AN ACTUAL EXAMPLE?

A32. Yes. To illustrate this concern, in Case No. PUR-2019-00201, the Company's response to Staff Interrogatory No. 7-84 estimated that 6,800 new homes were constructed within the Company's service territory on an annual basis.[42] Of these, the Company estimated that NVR would build approximately 51.5%, or 3,500 homes, per year. Both NV Homes and Ryan Homes, subsidiaries of NVR,[43] have substantially the same video available on their website, in which Dan Simons, Director of Architectural Services, states, "NVR homes are built to exceed industry standards for energy efficiency, and the BuiltSmart program incorporates several components and building techniques of our own, beyond the EPA and

[42] 2019 Dalton Direct at Attachment No. DJD-4, pages 36-38, included in Attachment No. DJD-3.

[43] *See* NVR Inc., "Who We Are," from www.nvrinc.com, accessed March 10, 2021. A printed copy of the cited webpage is included in Attachment No. DJD-2.

EnergyStar requirements."[44] This illustrates Staff's concern that the use of code minimum baselines against which to measure the energy savings from the Phase VIII Residential New Construction Program result in overstated savings estimates attributable to the program, given that more than half of the homes expected to be built in the Company's service territory each year appear to exceed not only code minimum standards but also, in at least some regards, those of the EnergyStar program as well.[45]

Consistent with Staff's recommendations in Case No. PUR-2019-00201, an appropriate step in determining the specific baseline or baselines would be for the Company and DNV GL to perform studies of actual new homes of the same model type built within the Company's service territory by each participating builder that are not incented to be energy efficient as the model types built as part of the Phase VIII Residential New Construction Program to develop the appropriate baselines. This would provide a utility-specific baseline against which to measure the energy and demand savings achieved through the Phase VIII Residential New Construction Program.

Question 4 – Estimated Costs of Developing Utility-Specific Baselines

Q33. DID THE COMPANY PROVIDE THE COSTS OR ESTIMATED COSTS OF DEVELOPING VIRGINIA-SPECIFIC OR UTILITY-SPECIFIC BASELINES, CONSIDERING VARYING LEVELS OF COST AND DETAIL?

[44] *See* NV Homes, "BuiltSmart Efficiency," from www.nvhomes.com/builtsmart, accessed March 10, 2021, and Ryan Homes, "BuiltSmart Efficiency," from www ryanhomes.com/builtsmart, accessed March 10, 2021. Printed copies of the cited pages are included in of Attachment No. DJD-2.

[45] Assuming the code minimum as the baseline will result in the Company claiming credit for naturally-occurring organic energy efficiency taking place in the market and overstating the energy savings of the program.

A33. In its Initial Filing, the Company provided a general discussion and broad range of options and costs for developing Virginia-specific and utility-specific baselines for its currently offered programs and measures. Specifically, Section 3.1 of the EM&V Background & Information Report includes Table 3-2, which outlines DNV GL's assessment of the types of studies it is possible to undertake to "collect more utility-specific and/or Virginia-specific data on existing conditions and/or common practice."[46] An excerpt of Table 3-2, including the type of baseline, example of study activities, cost range of baseline and relative cost, and length of study, is reproduced in Figure 2, below, for convenience.

[46] EM&V Background & Information Report at 44.

Figure 2: Baseline Study Descriptions to Include a Cost Estimate[47]			
Type of Baseline	Example of Study Activities	Cost Range of Baseline and Relative Cost	Length of Study
Existing conditions of specific measures, groups of measures, or a comprehensive study of as many measures or building types as feasible	Metering and verification of existing conditions at a collection of sample sites.	$1 million+	2-3 years
Codes and Standards	Research applicable prevailing codes and standards	Minimal	Days to weeks
Common practice for specific measures or groups of measures	- Retrofit/upgrade/new equipment: Survey of vendors, distributors, and industry experts; - New Construction: Survey and data collection from permit offices, if they are willing to share data; - A survey of equipment suppliers and/or system designers on standard practice, relative cost, and applicability; - Interviews with multiple national technology experts on standard practice, relative cost, and applicability; - Analysis of manufacturer or distributor shipment volumes by efficiency tier; - Analysis of a sample of recently filed new construction drawings; - Survey of customers, likely program nonparticipants, that have taken similar actions near the time of application; and - Citation of recent relevant secondary research. (Footnote omitted)	From tens of thousands of dollars and above, depending on the level of rigor required.	A few months to two years.

[47] *Id.* at 45-46.

Staff Interrogatory No. 6-64 requested, among other things, cost estimates for developing utility-specific baselines for each measure currently offered by the Company. The Company's response referenced information provided in its response to Staff Interrogatory No. 5-38, specifically a cost estimate for developing utility-specific data for all input variables utilized in estimating energy and demand savings attributable to the Company's DSM programs, and stated "Staff could extrapolate [the cost estimate] to all 136 measures and use that value as a simple average to estimate total costs." Staff's calculation, based on the guidance and information provided by the Company, is that it would cost approximately **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** to collect utility-specific or Virginia-specific data for use as baseline input variables in estimating energy and demand savings attributable to the Company's energy efficiency programs.

The Company's Extraordinarily Sensitive response to Staff Interrogatory No. 9-117 estimates that the cost of gathering utility- or Virginia-specific data for use as baseline input variables would be approximately **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** The response states that this higher estimate is because there are a number of fixed costs associated with gathering this information that do not appear to decrease despite sampling only the baseline input variables. These fixed costs, and their magnitude, were not fully identified in the Company's response to Staff Interrogatory No. 5-38.

Staff expects that, to the extent some portion of the baselines currently used by the Company are determined to be utility- or Virginia-specific, this cost would decrease accordingly.

Question 5 – Planned EM&V Methodology and Costs at Program Proposal and Proposed Changes

Q34. DID THE COMPANY PROVIDE THE METHODS BY WHICH IT PLANNED TO MEASURE ENERGY AND DEMAND SAVINGS FOR EACH PROGRAM AND/OR MEASURE AT THE TIME OF ITS PROPOSAL?

A34. Appendices D and E of the EM&V Background & Information Report provide the EM&V plans for the Phase VII[48] and Phase VIII[49] Programs, respectively, that were developed at the times of their proposals. The Company's response to Staff Interrogatory No. 4-27 states that the Phases I, II, IV, V, and VI Programs did not include EM&V plans at the time of proposal because the EM&V Rules were not in effect when the Company petitioned for approval of these programs. Appendix D, however, includes descriptions of the **current** EM&V methodologies for the Phase I, II, IV, V, and VI Programs. Generally, and as will be discussed in more detail later in this testimony, the two approaches are "Deemed Savings Approaches" and "Evaluated Savings Approaches."

Q35. WHAT IS A "DEEMED SAVINGS APPROACH?"

A33. The Company defines "Deemed Savings Approach" as the use of "deemed savings calculations," sourced, primarily, from the Mid-Atlantic Technical Reference manual ("Mid-Atlantic TRM").[50] Deemed savings calculations that use only deemed input variables[51] produce "fully deemed savings," which are values that are fixed regardless of

[48] The Phase VII Programs were proposed and approved in the Company's 2018 DSM Case. *See* 2018 DSM Order.

[49] The Company's Phase VIII Programs were proposed and approved in the Company's 2019 DSM Case. *See* 2019 DSM Final Order.

[50] EM&V Background & Information Report, Appendix D at 2.

[51] Staff will be using the term "deemed input variable" to refer to the Company's equivalent usage of "deemed variable."

any on-site or project-specific conditions or factors.[52] Deemed savings calculations that use a combination of deemed input variables and site- or project-specific input variables result in "partially deemed savings values."[53]

The Company defines "deemed savings calculations" as engineering algorithm(s) used to calculate energy and demand savings associated with installed efficiency measures using "deemed [input] variables" and site- or project-specific input variables.[54]

"Deemed [input] variables" are defined as values for input assumptions that determine the performance of an energy efficiency measure under different operating conditions, applications, climates, or other conditions.[55]

The Company's response to Staff Interrogatory No. 4-28 states that the following programs are using the Deemed Savings Approach as their EM&V methodology:

- Phase IV Residential Income and Age Qualifying Home Improvement Program;
- Phase V Non-Residential Small Business Improvement Program;
- Phase VII Non-Residential Heating and Cooling Efficiency, Non-Residential Lighting Systems & Controls, Non-Residential Office, Non-Residential Small Manufacturing, Non-Residential Window Film, Residential Appliance Recycling, and Residential Home Energy Assessment Programs; and
- Phase VIII Non-Residential Heating & Cooling HB 2789, Non-Residential Midstream Energy Efficient Products, Non-Residential Multifamily, Non-Residential New Construction, Non-Residential Small Business Improvement Enhanced, Residential Customer Engagement, Residential Electric Vehicle Demand Response/Residential Electric Vehicle Peak Shaving, Residential Electric Vehicle Energy Efficiency, Residential Energy Efficiency Kits, Residential HB 2789 HVAC Component, Residential Home Retrofit,

[52] EM&V Background & Information Report at 7.

[53] *Id.*

[54] *Id.*

[55] *Id.*

Residential Manufactured Housing, Residential Multifamily, Residential New Construction, Residential Smart Thermostat Behavioral Energy Efficiency, Residential Smart Thermostat Demand Reduction, and Residential Smart Thermostat Energy Efficiency Programs.[56]

Q36. DOES STAFF HAVE CONCERNS REGARDING THE DEEMED SAVINGS APPROACHES DESCRIBED BY THE COMPANY?

A36. Yes.

Q37. WHAT ARE STAFF'S CONCERNS REGARDING THE DEEMED SAVINGS APPROACH?

A37. First, Staff has concerns regarding the use of deemed input variables in estimating energy and demand savings attributable to the programs in the Deemed Savings Approach. As previously mentioned, the Commission, through its EM&V Rules, has expressed a preference for utility-specific data in estimating the energy and demand savings resulting from DSM programs. Staff has previously expressed concerns regarding the use of deemed input variables in the estimation of energy and demand savings in the 2019 DSM Case.[57]

In sum, the Deemed Savings Approach utilizes equations, the inputs of which are a combination of customer-, site-, or project-specific and deemed input variables that come from various sources such as TRMs, primarily the most-recent version of the Mid-Atlantic TRM, other studies, and other non-Virginia-jurisdictional sources. Indeed, the Company

[56] The Company's response also states that the Phase VII Programs, excluding the Phase VII Residential Efficient Products Marketplace, did not have 2019 participation data to perform an Evaluated Savings Approach and the Phase VIII Programs were not launching until "early 2021." Staff notes that the Phase I AC Cycling Program and Phase II Distributed Generation Program are only evaluated using an Evaluated Savings Approach because they are demand response programs.

[57] *See, e.g.*, 2019 Dalton Direct at 14-18, included in Attachment No. DJD-3.

identifies the results of calculations that use a combination of deemed input variables and customer-, site-, or project-specific input variables as "partially deemed savings values."[58] Staff acknowledges that the use of these values is permitted by the Commission's EM&V Rules, but it is unclear to Staff that these estimates would be sufficient for meeting a measured and verified standard for complying with the energy reduction targets required by the VCEA. Staff notes that the EM&V Rules were promulgated under different statutory language relevant to energy efficiency. Under this prior language, the Company was allowed to seek cost recovery for "lost revenues" associated with measured and verified savings. The Company could have, but did not, perform EM&V under the higher standard allowed under the Commission's EM&V Rules. Instead, the Company chose to comply with the EM&V Rules under the lower standard and did not seek lost revenues.

Staff is also concerned that uncertainty is introduced into the calculation of savings due to the use of deemed input variables, which are developed by studies performed in other jurisdictions and which may or may not accurately reflect actual conditions of operation of the equipment by a specific participant. The use of deemed savings calculations, deemed input variables, and the uncertainty and potential error associated with savings estimates calculated using them is discussed more fully in the Direct Testimony of Staff witness Ferrell.

Q38. CAN STAFF PROVIDE ILLUSTRATIVE EXAMPLES OF ITS CONCERNS?

A38. Yes, Staff can provide two relatively simple examples. First, to demonstrate Staff's concerns regarding the accuracy of deemed input variables, Staff offers the Final

[58] EM&V Background Information Report, Section 2.2.3, page 24.

Evaluation Report: Upstream Lighting Program, Volume 1 ("California Report"),[59] performed by The Cadmus Group, Inc., and KEMA, Inc.,[60] on behalf the California Public Utilities Commission ("CPUC"), excerpts of which are attached hereto as part of Attachment No. DJD-4. At a high level, the report presents the results of an impact evaluation of a three-year program designed to provide manufacturer or distributor instant discounts for eligible lighting products then sold to participating retailers.[61] Staff notes that, at the time, California offered incentive-based profit margins to utilities meeting or exceeding measured and verified energy efficiency savings goals, termed the Risk/Reward Incentive Mechanisms, which is generally similar to the profit margin incentives available to Virginia utilities under the VCEA.[62] Importantly, KEMA, Inc., performed this study on behalf of its client, CPUC, and not on behalf of the California utilities. The California Report found that the program saved only approximately 25% of the utilities' *ex-ante* estimates of energy savings.[63] This is because a number of deemed input variables were found to be incorrect.[64] For example, a contributing factor to this underperformance

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[59] *See* Final Evaluation Report: Upstream Lighting Program, Volume 1 ("California Report"), CALMAC Study ID: CPU0015.01, prepared by KEMA, Inc., prepared for California Public Utilities Commission, Energy Division, February 8, 2010. Due to the voluminous nature of this report, Staff is attaching only the referenced excerpts to this testimony as part of Attachment No. DJD-4. Staff has maintained a full, electronic copy of this report and will provide it upon request.

[60] KEMA, Inc., was acquired in 2011 by DNV, which, in 2013, merged with GL to become DNV GL.

[61] *See* California Report at 2.

[62] *Order Instituting Rulemaking to Examine the Commission's post-2005 Energy Efficiency Policies, Programs, Evaluation, Measurement and Verification, and Related Issues*, California Public Utilities Commission, Decision 07-09-043 (Sept. 20, 2007) at 2-14. Due to the voluminous nature of this document, Staff is attaching only the referenced excerpt as part of Attachment No. DJD-4. Staff has maintained a full copy of the referenced document and will provide it upon request.

[63] *See* California Report at i, xii, 71-72, and 74-79.

[64] For example, Staff notes that the assumed installation rates of lightbulbs and the assumed difference in wattage between baseline lightbulbs and efficient lightbulbs ("delta watts") were found to be overstated in *ex ante* estimates relative to the actual installations that occurred. *See* California Report at 74-79.

relative to anticipated savings was that the actual input variables for hours of operation of the lighting were found to be approximately 20% lower than the deemed input variables used at the time of developing *ex-ante* savings estimates.[65] Thus, at least partly because a deemed input variable was incorrect, the program did not produce the energy savings expected.

To illustrate Staff's concerns regarding the use of deemed input variables developed in jurisdictions other than Virginia, Staff will highlight the Phase IV Income and Age Qualifying Home Improvement Program.

Q39. PLEASE CONTINUE.

A39. The Phase IV Income and Age Qualifying Home Improvement Program consists of five measures: replacing incandescent lightbulbs with LED bulbs, pipe insulation installed on exposed and accessible hot water supply lines from an electric water heater, installation of low-flow showerheads, installation of aerators in kitchen and bathroom faucets, and installation of attic insulation.[66]

The savings for each measure is calculated using equations that require specific input variables.[67] Appendix C of the EM&V Background & Information Report provides the source documentation for these variables. For convenience, Appendix 2 of this testimony compiles the formulae, input variable definitions, and input variable sources. Of the 45 input variables utilized to calculate the energy and demand savings associated with

[65] *Id.* at 76.

[66] EM&V Background & Information Report, Appendix D, Section G.2, page 4.

[67] *See, e.g.*, EM&V Background & Information Report, Appendix C, Section 2.1, page 17.

the five measures in the Phase IV Income and Age Qualifying Home Improvement Program, 31, or approximately 68.9% are from sources outside Virginia and would be considered deemed input variables as previously defined. Staff has concerns about the possible effects of sourcing this many variables from non-Virginia sources.[68] While this analysis only addresses one program, Staff's review of the Deemed Savings Methodologies for the other programs found a general consistency with this analysis.

Staff also notes that, in several instances, it was unable to locate the original source documentation for the studies supporting some of the deemed input variables used in estimating energy or demand savings for the Phase IV Residential Income and Age Qualifying Home Improvement Program. In some cases, the Company's EM&V contractor was unable to provide these studies.[69] In those instances, the Company stated, "As indicated in [the Company's response to] Staff [Interrogatory No.] 2-13: 'DNV GL will attempt to review any sources that are referenced by the source TRM; however, in some cases, original sources may not be available for DNV GL to review because the documents are based on impact evaluations or materials that are not publicly available.'"[70] Staff is concerned that there are instances where source documentation supporting inputs used to estimate energy and demand savings attributable to the Company's DSM programs is not available to Staff or the Company's EM&V contractor for review and verification of the reasonableness of these studies and, as a result, of the deemed input variables. Staff

[68] Staff notes that this includes federal codes and standards; however, for the reasons previously discussed, these may or may not accurately reflect the conditions of participating customers. Staff maintains its recommendations that, should the Commission desire more accurate savings estimates, these be thoroughly studied.

[69] *See* the Company's responses to Staff Interrogatory Nos. 5-45 and 5-46, included in Attachment No. DJD-1.

[70] *Id.*

believes that a "trust but verify" approach is necessary to evaluate EM&V input variable values; however, in these instances, Staff is reduced to "trust" alone, with no opportunity to "verify." Should the Commission direct the Company to perform studies to develop Virginia-specific or utility-specific data, it may be appropriate that any deemed input variable for which source documentation is unavailable be given priority.

Q40. DOES THE COMPANY PROVIDE ANY ALTERNATIVE APPROACHES TO THE DEEMED SAVINGS APPROACH?

A40. For most programs, yes. Appendix D of the EM&V Background & Information Report includes descriptions of "Evaluated Savings Approaches"[71] for the following programs:

- Phase I AC Cycling Program;
- Phase II Distributed Generation Program;
- Phase IV Residential Income and Age Qualifying Home Improvement Program; and
- Phase VII Non-Residential Heating and Cooling Efficiency, Non-Residential Lighting Systems & Controls, Non-Residential Office, Non-Residential Small Manufacturing, Non-Residential Window Film, Residential Appliance Recycling, Residential Efficient Products Marketplace, and Residential Home Energy Assessment Programs.

Appendix E of the EM&V Background & Information Report includes Evaluated Savings Approaches for the Phase VIII Programs.[72] The Evaluated Savings Approaches are program-specific planned evaluation approaches utilizing methods the Company believes are appropriate to measure and verify the energy and demand savings achieved by

[71] *See, e.g.*, Appendix D, Section G.5, page 5; Appendix D, Section H.5, pages 2-3.

[72] *See, e.g.*, Appendix E, Section 2.5, pages 7-8; Appendix E, Section 4.5, pages 15-16.

the respective program. They may include on-site verification of certain details about installed measures as well as ensuring the measures are installed and operating according to specifications. As will be discussed later in this testimony, however, these approaches continue to use deemed input variables in their estimation of energy and demand savings.

Q41. HAS THE COMPANY IDENTIFIED WHICH PROGRAMS ARE CURRENTLY USING THE EVALUATED SAVINGS APPROACH?

A41. Yes. The Company's response to Staff Interrogatory No. 4-28 shows that the Phase I AC Cycling Program, Phase II Distributed Generation Program, Phase VI Non-Residential Prescriptive Program, and Phase VII Residential Efficient Products Marketplace Program are currently undergoing impact analyses utilizing their respective Evaluated Savings Approaches.

Q42. HAS THE COMPANY PROVIDED AN EXPLANATION OF WHY THE REMAINING PROGRAMS ARE NOT CURRENTLY UTILIZING THE EVALUATED SAVINGS APPROACH?

A42. For most programs, yes. The Company's response to Staff Interrogatory No. 4-28 states that the Phase VIII Programs only launched "in early 2021." The Phase VII Non-Residential Heating & Cooling Efficiency, Non-Residential Lighting Systems & Controls, Non-Residential Office, Non-Residential Small Manufacturing, Non-Residential Window Film, and Residential Home Energy Assessment Programs were all identified as having "no 2019 program participation."

The Company's response to Staff Interrogatory No. 6-74 states that the Phase VII Residential Appliance Recycling Program has not undergone an Evaluated Savings Approach because it was launched "in late 2019" and has not been evaluated "because it has not achieved 12 months of program history." The response also states that the Phase V Non-Residential Small Business Improvement Program has not undergone an Evaluated Savings Approach because it launched in 2016, prior to the issuance of the EM&V Rules.[73] Finally, the response states that the Phase IV Residential Income and Age Qualifying Home Improvement Program has not undergone an Evaluated Savings Approach because it "is exempt from meeting cost-effectiveness requirements."

Q43. DOES STAFF HAVE CONCERNS REGARDING THE COMPANY'S EVALUATED SAVINGS APPROACHES?

A43. Yes. First, Staff is concerned regarding the method of determining the application of the Evaluated Savings Approaches. Specifically, each Evaluated Savings Approach presented in Appendices D and E generally include language identical or similar to, "During program implementation Dominion Energy will determine, in consultation with DNV GL, the appropriateness of conducting evaluations to estimate program net savings in net kilowatt and net kilowatt-hours."[74] The Company states it will use a "value of information framework" to determine which programs will receive primary impact evaluations, or the Evaluated Savings Approach, in a given year.[75] The Company also states that not all

[73] The Commission's EM&V Rules became effective January 1, 2018.

[74] *See, e.g.*, Appendix D, Section J.5, page 2.

[75] EM&V Background & Information Report, Section 2.2.2, page 19.

programs will be evaluated through a primary impact evaluation, "as it will not be cost-effective to do so."[76]

While Staff appreciates that this approach attempts to balance costs and certainty of savings estimates, Staff is concerned that several programs will only be subject to the Deemed Savings Approach, utilizing deemed input variables alongside site-, project-, and customer-specific variables, to estimate energy and demand savings resulting from the programs. Staff remains concerned that these estimates are likely insufficient for meeting a measured and verified standard for compliance with the energy reduction targets contained in the VCEA as well as the stated preference, contained in the EM&V Rules, for utility-specific and/or Virginia-specific data in estimating energy and demand savings attributable to energy efficiency or DSM programs.

Q44. DOES STAFF HAVE AN ADDITIONAL CONCERN REGARDING THE COMPANY'S EVALUATED SAVINGS APPROACHES?

A44. Yes. The Company's responses to Staff Interrogatory Nos. 6-73 and 10-123, state that the Evaluated Savings Approaches utilized by the Company will also use deemed input variables in the estimation of energy and demand savings attributable to the energy efficiency programs. For all the reasons identified above regarding the use of deemed input variables in estimating energy and demand savings under the Deemed Savings Approach, Staff is similarly concerned that the use of deemed input variables will not provide sufficiently rigorous data to be considered measured and verified for purposes of

[76] *Id.*

complying with the VCEA energy savings targets, nor would these values qualify as utility-specific or Virginia-specific.

Q45. DID THE COMPANY PROVIDE THE COSTS OF DEVELOPING THE METHODS BY WHICH IT PLANNED TO MEASURE ENERGY AND DEMAND SAVINGS FOR EACH PROGRAM AND/OR MEASURE AT THE TIME OF ITS PROPOSAL?

A45. In its Initial Filing, the Company states that "EM&V activities proposed for each program are designed to keep costs at the portfolio level to be within 3-7% of program-level and/or total-portfolio level spending" for non-pilot programs.[77] The Company states that this is "in keeping with industry best practices."[78] The Company's response to Staff Interrogatory No. 1-4 states, in part, "As a rule of thumb, the scope of an evaluation is informed by the program budget. EM&V budgets typically ranges [sic] from 2 to 7% of the total program or portfolio budget." The Company's response to Staff Interrogatory No. 3-22 states that, through Phase VIII, the estimated EM&V costs for its DSM programs is approximately 5% of a program's total budget, exclusive of lost revenues estimates.

Section 3.2, beginning on page 47 of the EM&V Background Information Report, provides a general range of costs for EM&V activities, ranging from less than $50,000 to more than $1,000,000, depending on the activity undertaken. Table 3-3 then provides general descriptions of the types of activities that may be undertaken at various points within the less-than-$50,000-to-more-than-$1,000,000 range provided.

[77] EM&V Background & Information Report, Section 2.2.5, page 38.

[78] *Id.*

The Company's response to Staff Interrogatory No. 4-27, which, among other things, requested cost estimates for developing the EM&V plans provided at the time of program proposal, referred to Appendices D and E of the EM&V Background & Information Report for the Phase VII and Phase VIII Programs. Staff was unable to locate any cost estimates for developing the EM&V plans as requested. The Company's response continues that, because the EM&V Rules were not in effect at the time of proposal of the Phases I, II, IV, V, and VI Programs, the Company did not have a specific plan in place to measure energy and demand savings at the time of proposal.

The Company's Extraordinarily Sensitive response to Staff Interrogatory No. 9-119[79] reiterates many of the statements in the Company's responses to Staff Interrogatory Nos. 3-22 and 4-27. The response also states that for Phases I through VII, the Company did not track specific costs, in dollars, of developing the method by which the Company planned to measure energy and demand savings when the Company proposed each program and/or measure. Also included in the Company's Extraordinarily Sensitive response to Staff Interrogatory No. 9-119, however, is an estimated cost of **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** to develop the EM&V Plans filed at the time of program proposal for the Company's Phase VIII Programs.

[79] Because the Company had not provided all of the requested information in its Initial Filing or previous interrogatory responses, Staff Interrogatory No. 9-119 requested that the Company respond to the following (quoted directly from the Order Initiating Proceeding [footnote omitted]):

> Explain the method, including its cost or estimated cost, by which the Company planned to measure energy and demand savings when the Company proposed that program and/or measure, whether the Company's plans have changed, and why the change is recommended.

Q46. DID THE COMPANY IDENTIFY WHETHER THE EM&V METHODS HAVE CHANGED SINCE THE TIME OF PROGRAM PROPOSAL, INCLUDING EXPLANATIONS FOR ANY SUCH CHANGES?

A46. The Company did not explicitly identify whether the EM&V methods had changed. Staff's review of the EM&V methods provided in Appendices D and E of the EM&V Background & Information Report for the Phase VII and Phase VIII Programs (which included EM&V plans at the time of their filing), compared to the EM&V plans filed when proposed, did not reveal any obvious changes to Staff. Staff notes, however, that there are numerous changes to the deemed input variables utilized in the estimation of the savings attributable to the energy efficiency programs. The explanations for these changes are consistent with those offered for changes to the EM&V baselines previously discussed – that the source documentation for these input variables, primarily the most recent version of the Mid-Atlantic TRM, updated its deemed input variables.

As stated previously, the Company's Phases I, II, IV, V, and VI Programs did not include EM&V plans at the times of their proposal as the EM&V Rules were not in effect at those respective times.

Question 6 – EM&V Rules Order of Preference of EM&V Plans

Q47. DID THE COMPANY IDENTIFY IN WHICH ORDER OF PREFERENCE PROVIDED IN 20 VAC 5-318-40, *MINIMUM REQUIREMENTS FOR COLLECTION OF EVALUATION MEASUREMENT AND VERIFICATION DATA*, THAT THE COMPANY'S PLANS FOR MEASURING ENERGY AND DEMAND SAVINGS FOR EACH PROGRAM FALL?

A47. Yes. Table 2-3 of the EM&V Background & Information Report shows that, in the Company's opinion, all EM&V plans are customer-specific, which, as previously mentioned, the Company believes to be a subset of utility-specific data.[80]

Q48. DOES STAFF AGREE WITH THE ASSERTION THAT THE EM&V PLANS ARE CUSTOMER- OR UTILITY-SPECIFIC UNDER 20 VAC 5-318-40?

A48. No. Staff again notes that the majority of the DSM programs considered in the instant case will be evaluated, at least in the short-term, using the Deemed Savings Approach. This approach, again, utilizes deemed savings calculations that include the use of deemed input variables that are not sourced from Virginia or the Company's service territory. Staff understands the order of preference provided in 20 VAC 5-318-40 to require more than only some of the variables used in estimating energy and demand savings attributable to Company-sponsored energy efficiency programs to be utility- or Virginia-specific for the EM&V plans to qualify as either of these categories.

Even in the longer term, as discussed previously, should the Company apply its Evaluated Savings Approach, this methodology continues to use deemed input variables in estimating the energy and demand savings attributable to the energy efficiency programs.[81] Staff recommends that the Commission provide guidance on what amount, if any, of deemed input variables can be utilized in estimating energy and demand savings for the

[80] EM&V Background & Information Report, Section 2.2.2, pages 22-23.

[81] *See* the Company's responses to Staff Interrogatory Nos. 6-73 and 10-123, included in Attachment No. DJD-1. The Company's response to Staff Interrogatory No. 6-73 states, in part, that the impact evaluations for the Phase VI Non-residential Prescriptive Program and Phase VII Residential Efficient Products Marketplace Program both still rely upon deemed savings calculations, which Staff understands to mean, as defined on page 7 of the EM&V Background & Information Report, that the calculations use deemed input variables or a combination of deemed input variables and site- or project-specific variables.

results to be considered "utility-specific" or "Virginia-specific," especially for purposes of meeting the measured and verified standard contained in the VCEA.

Q49. DOES STAFF HAVE ANY COMMENTS ON THE COMPANY'S EM&V PLANS AND THEIR COMPLIANCE WITH THE EM&V RULES?

A49. Yes. Generally, the Company's EM&V plans comply with the minimum requirements of the EM&V rules as written. Staff reiterates that, given the legislative changes that have occurred in the intervening period since adoption of those rules, as well as the Commission's finding that more rigorous EM&V is necessary to ensure that programs are, in actual practice, the proximate cause of a verifiable reduction in energy usage, it may be appropriate for the EM&V Rules to be revisited to increase the minimum level of rigor to satisfy the Commission's desires for utility-specific and Virginia-specific data that would also meet a standard of measured and verified for purposes of complying with the VCEA energy efficiency savings targets.

Q50. DOES STAFF HAVE RECOMMENDATIONS FOR OBTAINING VIRGINIA-SPECIFIC AND UTILITY-SPECIFIC DATA FOR USE IN EM&V?

A50. Yes. Staff has prepared a recommendation and several options should the Commission determine more rigorous EM&V is required, including the use of more Virginia- and utility-specific data in the estimation of energy and demand savings attributable to the Company's energy efficiency programs. Staff believes that this is appropriate given the increased emphasis on accurately measuring and verifying energy savings contained in the statutory language of the VCEA as discussed previously in my testimony.

As discussed by Staff witness Ferrell, Staff recommends that the Commission direct the Company to analyze *actual energy consumption data* in the estimation of energy savings attributable to its energy efficiency programs. In her testimony, Ms. Ferrell discusses various billing or consumption analysis methods and explains how this approach to estimating savings differs from the Company's deemed calculation approach. Briefly, this would involve analyzing the changes in consumption data pre- and post-treatment. This is a relatively straightforward approach that completely avoids the reliance on deemed input variables to estimate customer energy and demand savings. Additionally, billing analyses address several concerns regarding changes in customer behavior post-treatment and other possible exogenous factors that may not be captured by deemed calculations. Lastly, billing analyses can be used in addition to the EM&V methodologies currently utilized or to be utilized by the Company, as well as in addition to the options presented below, as a check that would provide a higher level of confidence in energy savings estimates.

In addition to the billing analyses discussed by Staff witness Ferrell, should the Commission desire that more utility-specific and Virginia-specific data be utilized as input variables in the Company's deemed savings calculations or other methodologies, I offer multiple options for obtaining such data. The options presented are not intended to represent all available options for increasing rigor and data quality. Rather, they are included in an attempt to more fully develop the range of options available and provide specific examples that may be appropriate for consideration to develop Virginia-specific and utility-specific data for estimating savings attributable to the Company's energy efficiency programs. Staff believes that this may be appropriate, in addition to the

consumption analyses discussed by Staff witness Ferrell, given the increased emphasis on accurately measuring and verifying energy savings contained in the statutory language of the VCEA as discussed earlier in my testimony.

Q51. DID THE COMPANY PROVIDE A COST ESTIMATE OF PERFORMING BILLING ANALYSES IN A MANNER DESCRIBED ABOVE?

A51. No, it did not. The Company's responses to Staff Interrogatory Nos. 9-114 and 9-115 objected to the request to provide cost estimates of the billing analysis methodology and referred Staff to Section 3.2 of the EM&V Background & Information Report for a general discussion of the range of study costs available to the Company for performing EM&V. Staff's understanding of Section 3.2 and Staff's expectation of cost will be discussed in more detail in response to the Commission's Question No. 7.

Q52. WHAT IS STAFF'S FIRST OPTION FOR OBTAINING VIRGINIA-SPECIFIC OR UTILITY SPECIFIC DATA FOR EM&V?

A52. The first option for improving the data quality for use in deemed savings calculations would be for the Company to perform suitably random sampling on each currently-deemed input variable utilized in calculating energy and demand savings for each measure. The Company's response to Staff Interrogatory No. 6-64 estimates that there are approximately 136 unique measures offered across the Company's Phases I through VIII Programs. While this would not be an insignificant undertaking, it would provide utility-specific input variables for each and every variable used in estimating energy and demand savings. Staff believes this may be a reasonable approach for several reasons.

The most obvious benefit to obtaining utility-specific data from such an in-depth study is increasing the specificity of the energy and demand savings estimated to be achieved by the Company's currently-offered DSM programs. Additionally, Staff notes that, historically, the Company has either sought renewal for expiring programs or redesigned them to include new measures or new approaches while also maintaining many of the previous version's measures.[82] Indeed, the Company's current programs include many shared measures across different programs.[83] To the extent that this practice continues in the future, gathering data for these measures currently would provide this same level of certainty gained for the current programs as for the to-be-proposed programs including the same measures. However, Staff recognizes that this data may need to be re-visited and updated periodically to avoid becoming stale.

Q53. DID THE COMPANY PROVIDE A COST ESTIMATE FOR OBTAINING VIRGINIA- OR UTILITY-SPECIFIC DATA IN THE MANNER YOU JUST DESCRIBED?

A53. Yes, and it will be discussed in response to the Commission's Question No. 7 later in this testimony.

[82] *See, e.g.*, the Company's Phase VII Non-Residential Window film and Residential Appliance Recycling Programs, which were previously offered in Phases III and IV, respectively.

[83] For example, Staff notes that the Phase IV Income and Age Qualifying Home Improvement Program, VII Residential Home Energy Assessment Program, Phase VIII Residential Manufactured Housing Program, and Phase VIII Residential Energy Efficiency Kits Program all include LED lighting upgrades, pipe insulation, low-flow showerheads, and kitchen and bathroom aerators as measures within the programs. *See* Appendix D, Section G, Appendix D, Section J, Appendix E, Section 5, and Appendix E, Section 11, respectively.

Q54. WHAT IS STAFF'S SECOND OPTION FOR OBTAINING UTILITY- OR VIRGINIA-SPECIFIC DATA FOR USE AS INPUT VARIABLES IN THE COMPANY'S EM&V?

A54. The option to measure deemed input variables is not a binary choice – continue with the methods currently employed and use deemed input variables, or measure, through random sampling, all currently-deemed input variables. Another option that may be appropriate, and which Staff would expect to be less costly than sampling all deemed input variables, would be to identify the key input variables – those most likely to have the largest impact on the accuracy of savings estimates – that are currently deemed input variables and perform random sampling on only this smaller subset of variables. Because savings estimates would continue to utilize some number of deemed input variables, Staff notes that this method would likely be less certain than measuring **all** deemed input variables; however, as stated previously, it should be less costly as well. Should the Commission desire more rigor than is currently achieved through the Company's methodology at less cost than measuring all deemed input variables, this option may be appropriate.

Q55. DID STAFF REQUEST AN ESTIMATE OF THE COST OF MEASURING SOME, RATHER THAN ALL, OF THE DEEMED INPUT VARIABLES?

A55. No. Staff will discuss possible costs, in a general manner, of this approach later in this testimony.

Q56. WHAT IS STAFF'S FINAL OPTION FOR OBTAINING UTILITY-SPECIFIC OR VIRGINIA-SPECIFIC DATA FOR USE IN THE COMPANY'S EM&V?

A56. Another option available to obtain utility- or Virginia-specific data would be for the Company to develop a pilot program that combines several elements of existing programs. Staff notes that, currently, the Company offers the Phase VIII Residential New Construction Program, which offers incentives to builders to install high-efficiency products in new-build houses. The Company could select a sample of new homes constructed in each region of its service territory – northern Virginia, the Richmond metro area, and the Hampton Roads area – install a suitable number of each measure currently offered in each of its residential programs, and install submeters on each incented measure within the home. This would provide actual energy consumption and usage patterns in the newly-constructed homes' energy efficient products. The Company could further expand this measurement strategy to include a sample of existing homes, retrofitting them with the same items as the newly built homes and submetering them as well. This would address possible differences in actual efficiencies and usage patterns between new construction and older home stock. The resulting data, which would be utility- and Virginia-specific, could inform savings estimation for other program types incenting the same types of measures. Essentially, each of these homes would serve as a "laboratory" where each energy efficiency measure can be measured and evaluated. The results for each measure can then be extrapolated to the larger population of participants in each program and measure.[84]

This approach would be more rigorous than using deemed input variables from sources outside of Virginia in estimating savings attributable to energy efficiency programs

[84] Staff believes that it may be appropriate to implement this laboratory approach with customers who would qualify for participation in the Company's Percentage of Income Payment Program rate structure. This would, in addition to providing the laboratory environment for data collection described above, provide energy efficiency measures and programs directly to low-income customers.

as done in the current methodologies. This method could also be proposed as a pilot program, which Staff notes the VCEA states is in the public interest if it is "of limited scope, cost, and duration, [and] is intended to determine whether a new or substantially revised program or technology would be cost-effective."[85]

Q57. DID STAFF REQUEST A COST ESTIMATE OF THIS APPROACH?

A57. No, it did not. Staff notes that costs would depend on the number of houses included in the pilot. Costs could be contained by limiting the number of houses. Staff believes that even a small number of houses would provide valuable data for each of the energy efficiency programs and measures.

Question 7 – Estimated Costs of Utility-Specific EM&V Estimation

Q58. DID STAFF REQUEST A COST ESTIMATE FOR THE BILLING OR CONSUMPTION ANALYSES YOU DESCRIBED PREVIOUSLY?

A58. Yes. As mentioned previously, the Company's responses to Staff Interrogatory Nos. 9-114 and 9-115 objected to Staff's request to provide cost estimates for performing billing analyses. The Company's response referred Staff to Section 3.2 of the EM&V Background & Information report, which, again, provides a general range of costs that may be incurred for a range of EM&V activities. For the types of study that include "consumption analysis," the Company's estimated costs range between $50,000 and more than $1 million.[86] Staff, however, believes this would be a low-cost check on whether participants actually achieved

[85] Code § 56-576.

[86] EM&V Background & Information Report, Section 3.2, pages 47-50.

the expected savings from the measures they installed since the Company already collects the data involved.

Q59. DID THE COMPANY PROVIDE COST ESTIMATES FOR OBTAINING UTILITY-SPECIFIC DATA FOR MEASURING ENERGY AND DEMAND SAVINGS FOR ANY PROGRAM OR MEASURE THAT WAS NOT ALREADY MEASURED USING UTILITY-SPECIFIC DATA?

A59. In its Initial Filing, the Company identified the types of studies that could be undertaken to obtain utility-specific and Virginia-specific data and provided a wide range of cost estimates for such studies.[87] The cost range is between "less than $50,000" on the low end to "greater than $1,000,000" on the high end.

The Company's Extraordinarily Sensitive response to Staff Interrogatory No. 5-38 estimates that measuring all deemed input variables currently sourced from a technical reference manual or study performed outside of Virginia, for the programs offered in the Company's Phases I, II, IV, V, VI, and VII, would cost in excess of $12 million. Using the information provided in the Company's Extraordinarily Sensitive responses to Staff Interrogatory Nos. 5-38 and 6-64, Staff estimates that performing such measurements for all programs in Phases I, II, IV, V, VI, VII, and VIII would cost approximately **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]**[88]

[87] EM&V Background & Information Report, Section 3.2, pages 47-50.

[88] Staff's calculation is included as Appendix 3 of this testimony.

Staff notes that this would appear to be an upper bound of cost estimate. The Company's response to Staff Interrogatory No. 5-38 provides a wide range of input variables – between 140 and 700 – for the Phases I through VII Programs. To the extent that there are fewer variables that would require direct measurement under this approach, Staff expects that costs would decrease accordingly.

Q60. DOES STAFF HAVE ANY COMMENTS REGARDING THE COST ESTIMATE OF MEASURING ALL INPUT VARIABLES USED IN ESTIMATING ENERGY SAVINGS ATTRIBUTABLE TO THE COMPANY'S ENERGY EFFICIENCY PROGRAMS?

A60. Yes. Staff believes that the estimated cost of **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** should be considered in the context of several other factors. First, as Staff noted earlier, the Company is required to propose at least $870 million in energy efficiency expenditure between July 1, 2018, and July 1, 2028.[89] The estimated cost of measuring all input variables to obtain Virginia- and utility-specific data for estimating energy savings attributable to the Company's energy efficiency programs represents approximately **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** of the total required proposed expenditure.

Staff again notes that, to the extent that the Company continues to include measures already offered in existing programs in future proposed programs, the data collected

[89] Code § 56-596.2 C.

through measurement of all input variables would be appropriate to use in future proposed energy efficiency programs as well, at least in the near term.

Q61. IS THERE ANOTHER CONTEXT IN WHICH IT MAY BE APPROPRIATE TO CONSIDER THE COST OF MEASURING UTILITY-SPECIFIC DATA FOR INPUT VARIABLES?

A61. Yes. It may be appropriate to consider the cost of measuring utility-specific data for input variables relative to the value of the energy expected to be saved by the energy efficiency programs.[90] Using information provided in the Company's responses to Staff Interrogatory Nos. 8-89 and 8-90, including the Company's forecasts of PJM on-peak energy prices, off-peak energy prices,[91] and a simple average of the two prices, Staff calculated the value of the energy that must be saved to comply with the energy savings targets in the VCEA.[92] The results of this analysis are presented in Figure 3, below:

Figure 3: Value of Saved Energy

Year	Energy Efficiency Savings (MWh)	Value of Saved Energy, PJM On-Peak	Value of Saved Energy, PJM Off-Peak	Value of Saved Energy, PJM Avg.
2022	862,300	$32,467,382	$24,969,627	$28,718,477
2023	1,724,600	$66,712,718	$51,306,863	$59,009,790
2024	2,586,901	$99,210,226	$76,693,843	$87,952,035
2025	3,449,201	$139,661,592	$108,222,126	$123,941,859
Total:	**8,623,002**	**$338,051,864**	**$261,192,459**	**$299,622,161**

[90] *See, e.g., International Performance Measurement and Verification Protocol*, Prepared by Efficiency Valuation Organization, January 2012, Volume 1, at 45-46. Due to the voluminous nature of this document, Staff is including only the referenced excerpt as part of Attachment No. DJD-4. Staff has maintained a full copy of this volume and can provide it upon request.

[91] Staff notes that, in Case No. PUR-2020-00035, Staff took issue with the Company's PJM energy price forecast (among other things) as unreasonable.

[92] A complete table of Staff's calculations for Figures 3 and 4 is provided in Appendix 4 to this testimony.

As Figure 3 shows, if all of the Company's energy savings were to occur during PJM peak hours, the Company would avoid purchasing approximately $338 million worth of energy for the period 2022 through 2025 assuming it meets each annual energy efficiency savings target; if the energy savings were to occur exclusively off-peak, the Company would avoid purchasing approximately $261 million worth of energy for this period. Staff recognizes that some portion of energy will be purchased both on- and off-peak. Therefore, using the simple average of on- and off-peak prices in PJM, the Company would avoid purchasing approximately $300 million worth of energy, assuming the Company achieves each annual energy efficiency target for the period 2022 through 2025. The previously-discussed **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** associated with verifying, through measurement, the currently-deemed input variables represents approximately **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** of the $300 million in saved energy costs calculated using the average PJM on- and off-peak pricing.

Q62. ARE THERE OTHER REASONS STAFF BELIEVES THE COST ASSOCIATED WITH MEASURING ALL INPUT VARIABLES USED IN ESTIMATING ENERGY SAVINGS ATTRIBUTABLE TO THE COMPANY'S ENERGY EFFICIENCY PROGRAMS MAY BE REASONABLE?

A62. Yes. As discussed previously, the VCEA, among other things, established a mandatory RPS Program. As discussed earlier, to the extent that energy efficiency reduces the energy sales of the Company, customers will avoid not only the cost of energy purchases but also

REC purchases or generation requirements associated with the RPS Program compliance. The Company's response to Staff Interrogatory No. 8-91 provides the Company's REC price forecast for the period 2022 through 2025.[93] Staff used the energy efficiency savings targets, provided in the Company's response to Staff Interrogatory No. 8-90, the RPS Program requirements for percentage of Company sales that must be offset by RECs, and the REC price forecast to calculate avoided REC costs, shown in Figure 4, below.

Figure 4: Estimated REC Costs for RPS Compliance

Year	Energy Efficiency Savings Target (MWh)	RPS Program Requirement (%)	REC Price Forecast ($)	Avoided REC Costs ($)
2022	862,330	17%	$8.48	$1,243,092
2023	1,724,600	20%	$8.47	$2,921,473
2024	2,586,901	23%	$9.72	$5,783,275
2025	3,449,201	26%	$11.93	$10,698,731
Total:	**8,623,002**			**$20,646,571**

Should the Company achieve the RPS Program energy efficiency savings targets, the total estimated avoided cost of energy and RECs resulting from the energy reductions would be approximately $320 million. The previously-discussed **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** estimate to measure and verify all currently-deemed input variables utilized in estimating energy and demand savings attributable to the Company's energy efficiency programs represents only approximately **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** of this total value of avoided energy and REC purchases.

[93] Staff notes, for the record, that in Case No. PUR-2020-00035 (the Company's 2020 Integrated Resource Plan filing), Staff lacked confidence in the Company's REC price forecast as appropriately reflecting the impacts of the VCEA.

Staff notes that these percentages are calculated based only on energy efficiency savings to be achieved through 2025. To the extent that savings occur beyond this timeframe, the costs incurred in measuring and verifying input variables, which may have applications beyond the programs currently considered should the Company propose programs in the future with substantially the same measures, would have additional benefits of serving to inform energy savings estimates of those future programs as well.

Q63. IS STAFF AWARE OF ANY GUIDANCE ON THE APPROPRIATE LEVEL OF COSTS OF EM&V ACTIVITIES?

A63. Yes. Staff notes that the International Performance Measurement and Verification Protocol, for example, states that, in order to improve the precision of savings estimates, it may be appropriate to expend up to ten percent of the value of estimated savings on EM&V.[94]

Q64. ARE THERE OTHER, NON-COST REASONS WHY IT MAY BE APPROPRIATE TO SPEND THIS AMOUNT TO INCREASE THE RIGOR OF EM&V?

A64. Yes. In addition to these cost factors, Enactment Clause 7 of the VCEA states that it shall be the policy of the Commonwealth that the Commission, among other entities, shall consider whether and how energy programs and the placement of renewable energy facilities benefit local workers, historically economically disadvantaged communities (as

[94] *International Performance Measurement and Verification Protocol*, Prepared by Efficiency Valuation Organization, January 2012, at 45-46. Due to the voluminous nature of this document, Staff is including only an excerpt as Attachment No. DJD-4. Staff has maintained a full copy of the document and can provide it upon request.

defined in Code § 56-576), veterans, and individuals in the Virginia coalfield region that are located near previously and presently permitted fossil fuel facilities or coal mines. To the extent that energy savings are achieved by the Company's energy efficiency programs, benefits would flow to these groups through a number of possible means, including: bill impacts; avoided costs of energy, capacity, and RECs; the possible avoided need for future generation; etc. Increased rigor in EM&V would serve to more accurately quantify these benefits. This would allow for more thorough analyses in future requests for approval of various resources by developing a more complete picture of the Company's actual energy needs and all options available to meeting or reducing those needs.

Q65. PREVIOUSLY, YOU MENTIONED MEASURING ONLY KEY INPUT VARIABLES USED AS INPUTS IN DEEMED SAVINGS CALCULATIONS. DID STAFF REQUEST A COST ASSOCIATED WITH THIS METHODOLOGY?

A65. No; however, given that the calculations from the Company's responses to Staff Interrogatory Nos. 5-38 and 6-64 set an upper bound on costs for measuring all input variables, Staff would expect the cost to be less than the estimated **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] **[END EXTRAORDINARILY SENSITIVE]** for measuring all input variables. The final cost would depend on how many input variables were identified for measurement to reduce uncertainty in the appropriateness of the inputs, with more input variables measured resulting in costs closer to the **[BEGIN EXTRAORDINARILY SENSITIVE]** [redacted] [redacted] **[END EXTRAORDINARILY SENSITIVE]** and fewer input variables leading to lower costs, but more uncertainty. Should the Commission desire more certainty, Staff again believes

that measuring all input variables may be appropriate. Should the Commission wish to limit the costs of such activities, however, it may be appropriate for the Company to identify only the input variables with the largest impacts on savings estimates for measurement and verification, while maintaining use of deemed input variables for the remaining variables. Staff notes that this would continue the use of some non-Virginia data, which introduces more uncertainty, into savings estimates attributable to the Company's energy efficiency programs.

Q66. DID STAFF REQUEST A COST ESTIMATE FOR THE BILLING ANALYSIS YOU DESCRIBED PREVIOUSLY?

A66. Yes. As mentioned previously, the Company's responses to Staff Interrogatory Nos. 9-114 and 9-115 objected to Staff's request to provide cost estimates for performing billing analyses. The Company's response referred Staff to Section 3.2 of the EM&V Background & Information report, which, again, provides a general range of costs that may be incurred for a range of EM&V activities. For the types of study that include "consumption analysis," which Staff understands to be comparable to the billing analysis discussed above, the Company's estimated costs range between $50,000 and more than $1 million.[95]

Staff, however, believes this would be a low-cost check on whether participants actually achieved the expected savings from the measures they installed. The Company already collects usage data and could compile and weather-normalize at least 12 months pre- and post-treatment of such data for its participants, beginning the first year of

[95] EM&V Background & Information Report, Section 3.2, pages 47-50.

participation. Staff believes that the costs associated with performing the analysis would be minimal, as discussed more fully by Staff witness Ferrell.

Q67. DID STAFF REQUEST COST ESTIMATES FOR COSTS ASSOCIATED WITH SUBMETERING MEASURES AT NEWLY-CONSTRUCTED, AND RETROFIT OF EXISTING, HOME STOCK?

A67. No. Staff believes this option may be a cost-efficient method of developing Virginia-specific and utility-specific data for use as input variables, but the costs must be considered in the context of other options available for obtaining this data. Staff believes that the Company may be able to minimize costs specifically of the data collection for EM&V use by implementing the program as a pilot program. This would generate energy savings as well as provide valuable EM&V data for use in estimating future energy and demand savings attributable to energy efficiency programs that incent the implementation of the same or similar measures as those installed in the test homes.

Question 8 – Explanation if the Company Believes Actual Data Collection is Impossible

Q68. DID THE COMPANY STATE WHETHER IT BELIEVES ACTUAL DATA COLLECTION IS IMPOSSIBLE?

A68. Yes. The Company states, in Section 3.3 of the EM&V Report, that it does not believe that it is impossible to collect actual data to measure energy or demand savings for any specific measure.[96] Staff agrees with this assessment. Indeed, the Company's responses to Staff Interrogatory Nos. 5-38 and 6-64 provide cost estimates, discussed above, for doing so.

[96] EM&V Background & Information Report, page 51.

Other Considerations

Q69. HAS STAFF IDENTIFIED ANY OTHER ISSUES THAT STAFF BELIEVES NEED TO BE ADDRESSED IN THE INSTANT PROCEEDING?

A69. Yes. In addition to the answers sought by the Commission in its Order Initiating Proceeding, Staff's review of the Company's Initial Filing has identified three other issues that Staff believes would be appropriate to address in the instant case: (i) the proposed treatment of savings attributable to energy efficiency programs prior to the passage and implementation of the VCEA; (ii) the Company's application of information obtained from their Evaluated Savings Approaches to previously-reported energy and demand savings estimates; and (iii) the appropriate manner in which Staff is to investigate and the Commission is to approve or certify the Company's reported progress toward the energy efficiency savings targets contained within the VCEA.

Q70. WHAT DOES THE COMPANY PROPOSE REGARDING ENERGY EFFICIENCY SAVINGS ATTRIBUTABLE TO ITS PREVIOUSLY-OFFERED ENERGY EFFICIENCY PROGRAMS?

A70. As previously discussed, the Company's proposed Dashboard presentation would "track the Company's total persisting savings, on an annual basis, that its programs produce toward the [VCEA] savings targets."[97] The Company's response to Staff Interrogatory No. 7-80 states that it is the Company's understanding that all Virginia programs or phases are available to meet VCEA goals as long as savings are still being achieved by installed measures. The response continues that this includes all phases and programs where the

[97] EM&V Background & Information Report, Section 3.4, page 52.

assumed measure life of each measure has not ended and if previously-implemented programs and associated measures remain active and produce savings in the 2022 through 2025 timeframe, energy savings will be counted toward meeting the VCEA savings targets on an annual basis.

Q71. DOES STAFF HAVE ANY CONCERNS REGARDING THIS PROPOSED APPROACH?

A71. Yes. First, Staff does not have any inherent concerns regarding counting energy efficiency savings attributable to measures from previously-offered programs, *per se.* Staff's concerns are related to the EM&V performed on those programs when they were operational and what, if any, audits or checks will or should be performed to ensure continued operation of the measures installed that may have not yet reached the end of their useful lives.[98]

Q72. WHAT ARE STAFF'S CONCERNS REGARDING PREVIOUS PROGRAMS' EM&V?

A72. As is the case with the Company's Phases IV, V, and VI Programs, programs that have expired were designed, proposed, and approved prior to the implementation of the Commission's EM&V Rules. To the extent that these programs utilize deemed savings calculations, including the use of deemed input variables, Staff has the same concerns for these programs and measures that it has laid out above. Specifically, Staff is concerned

[98] The useful life of a measure is another deemed input variable used in estimating savings. If the actual life of a measure is shorter than the deemed or assumed life when the measure was approved as part of a larger program, then the Company may be claiming energy efficiency savings for measures that are no longer in use.

that the savings estimates from these programs may not use enough Virginia-specific or utility-specific data in their calculation. Staff is also concerned about potentially inadequate levels of rigor in the EM&V of these programs to measure and verify savings for purposes of meeting the VCEA energy savings targets. To address this, it may be possible to utilize data collected from the above-described methodologies, with adjustments, to more accurately estimate energy efficiency savings attributable to these programs.

Q73. WHAT ARE STAFF'S CONCERNS REGARDING THE CONTINUED OPERATION OF THE MEASURES FROM PREVIOUS PROGRAMS?

A73. The Company's response to Staff Interrogatory No. 7-81 states that the Company does not plan to conduct on-site checks to ensure that previously-installed measures are in service or otherwise operational after the approved life of a program. Staff believes it would be appropriate to audit existing installations for expired programs to ensure that the incented measures have remained in service and are continuing to operate as expected. This would allow for a higher level of confidence that the energy and demand savings estimates attributed to these programs are persisting in the expected manner. Staff believes the costs associated with performing such audits would be minimal. Staff believes that, should the Commission desire such audits to ensure energy and demand savings are persisting as expected, the Company could propose to recover such costs through the Company's current DSM rate adjustment clauses, Riders C1A, C2A, and C3A.[99]

[99] The Company has proposed a fourth DSM rate adjustment clause – Rider C4A – in pending Case No. PUR-2020-00274.

Q74. HOW DOES THE COMPANY PROPOSE TO UTILIZE INFORMATION GAINED FROM ITS EVALUATED SAVINGS APPROACHES?

A74. The Company's response to Staff Interrogatory No. 6-62 (b) states that, for measures with stage 3 evaluation conducted, which is the application of the Evaluated Savings Approach, the evaluated savings are reported for that year, and the evaluation results are used to update the tracking calculations going forward. The Company's response to Staff Interrogatory No. 8-99 confirms that the results of the Evaluated Savings Approach will only be utilized to update savings estimates going forward and will not be used to adjust previously-reported savings estimates.

Q75. DOES STAFF HAVE ANY COMMENT ON THIS APPLICATION OF THE EVALUATED SAVINGS APPROACH DATA?

A75. Yes. The use of data gained from the Evaluated Savings Approach to adjust **only** future savings estimates attributable to the Company's energy efficiency programs and not adjust prior estimates of savings is troubling to Staff. To the extent that an Evaluated Savings Approach demonstrates that savings estimates are overstated and that future savings need to be adjusted downward, the Company's methodology will allow the previously-reported savings estimates to remain overstated. Similarly, if an Evaluated Savings Approach shows that the Company was underreporting savings attributable to a given measure or program, the Company's method of applying information gathered from the Evaluated Savings Approach only to future savings estimates would understate savings attributable to the Company's programs.

Q76. DOES STAFF HAVE ANY RECOMMENDATIONS REGARDING THE ADJUSTMENT OF PRIOR PERIOD SAVINGS ESTIMATES BASED ON THE RESULTS OF THE EVALUATED SAVINGS APPROACH?

A76. Yes. Staff believes that, to address its concerns, the information gained through the Evaluated Savings Approaches should be used to adjust prior savings reports in subsequent EM&V reports filed with the Commission. The Commission should also direct the Company to use such information to update the Company's cost/benefit results to provide more accurate representations of the energy and demand savings actually achieved by the Company's energy efficiency programs.

Q77. HOW DOES THE COMPANY CURRENTLY REPORT ITS ENERGY EFFICIENCY SAVINGS ATTRIBUTABLE TO ITS DSM PROGRAMS?

A77. Currently, the Company administratively files annual EM&V Reports in previous case dockets, typically in May, reporting the energy and demand savings attributable to the Company's energy efficiency programs for the prior calendar year. At present, Staff only addresses these reports in the Company's subsequently-filed energy efficiency case. For example, Staff anticipates addressing concerns regarding the Company's 2020 EM&V Report,[100] which reports data from calendar year 2019, in Case No. PUR-2020-00274.[101]

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[100] *Petition of Virginia Electric and Power Company, For approval to implement demand-side management programs and for approval of two updated rate adjustment clauses pursuant to § 56-585.1 A 5 of the Code of Virginia*, Case No. PUR-2018-00168, Evaluation, Measurement, and Verification Report for Virginia Electric and Power Company (Dominion Energy), Doc. Con. Cen. No. 200530141 (May 15, 2020).

[101] *Petition of Virginia Electric and Power Company, For approval of its 2020 DSM Update pursuant to § 56-585.1 A 5 of the Code of Virginia*, Case No. PUR-2020-00274, filed December 2, 2020.

Q78. WHAT ARE STAFF'S CONCERNS REGARDING THE INVESTIGATION AND CERTIFICATION OF THE COMPANY'S REPORTED ENERGY EFFICIENCY SAVINGS?

A78. As noted above, the Company's current EM&V Reports are filed as administrative filings. Staff has not, historically, served discovery on this filing except in the context of other cases, such as the subsequently-filed energy efficiency application. The VCEA contains imposes various statutory obligations requiring the Commission to report the Company's progress to the General Assembly and other agencies and to develop new energy savings targets beginning in 2026. Staff further notes that the Company is entitled to a profit margin, and potentially a bonus, on energy efficiency expenses if it satisfies the energy efficiency savings targets. Therefore, Staff believes that the Company's reported energy efficiency savings must be fully investigated and the Commission must have a finding of fact regarding the sufficiency of the energy efficiency savings contained in the Company's EM&V Reports before a profit margin can be awarded. Staff is not necessarily suggesting that the filings themselves be moved from their current administrative schedule. Instead, Staff recommends that investigation of the reported values, and their calculations, be investigated as part of a formal proceeding.

Q79. DOES STAFF HAVE ANY SPECIFIC RECOMMENDATIONS REGARDING AN APPROPRIATE PROCEEDING TO ADDRESS THESE ISSUES?

A79. Staff does not have a specific recommendation, but the Commission may wish to consider these issues as part of future annual energy efficiency filings, as a stand-alone case, or as part of other formal proceedings, as appropriate.

Conclusions and Recommendations

Q80. CAN YOU PLEASE SUMMARIZE STAFF'S CONCLUSIONS AND RECOMMENDATIONS IN THE INSTANT CASE?

A80. Yes. Given the Commission's guidance from the 2019 DSM Final Order, which found, among other things, that "more rigorous [EM&V] is necessary to ensure that the [Company's DSM] programs are, *in actual practice*, the proximate cause of a verifiable reduction in energy usage," and the increased importance of accurate measurement and verification of energy under the VCEA, Staff's investigation results in the following conclusions and recommendations:

- Staff believes that it may be appropriate for the Commission to revisit the EM&V Rules to refine the minimum levels of rigor appropriate for estimating energy and demand savings attributable to the Company's energy efficiency programs, particularly as relates to achieving the energy savings targets contained within the VCEA (see pages 5-15 and 49-50 of this testimony for further discussion of this issue);

- Regarding the Company's proposed dashboard presentation, Staff recommends that the Commission direct the Company to include at least all of the information the Commission is required to report to the General Assembly and other state agencies pursuant to Code § 56-585.1 A 5 c (see pages 16-17 of this testimony for further discussion of this issue);

- Staff recommends the Commission direct the Company to document all baseline assumptions utilized at the time of program proposal and track, in an ongoing manner, all changes to these assumptions and the rationale for these changes. The Company should also be directed to provide this information to Staff and other interested parties upon request (see pages 18-22 of this testimony for further discussion of this issue);

- Regarding how the Company determines baselines for estimating energy savings, Staff recommends that the Company perform appropriate baseline studies within its service territory or within Virginia to obtain baseline assumptions that appropriately reflect the actual baselines of the Company's customers (see pages 23-29 of this testimony for further discussion of this issue);

- Additionally, regarding baseline assumptions utilized for programs that involve the construction of new building stock, Staff recommends the Commission direct the Company to calculate a weighted average baseline, reflecting the efficiencies of individual building models of participating vendors that would be built absent the Company-sponsored program (see pages 29-31 of this testimony for further discussion of this issue);

- Staff recommends that, at a minimum, the Commission direct the Company to perform consumption or billing analyses, which are discussed in Staff witness Ferrell's Direct Testimony (see pages 50-52 of this testimony for further discussion);

- Staff notes that, currently, most of the Company's EM&V methods use "deemed values," sourced from jurisdictions other than Virginia, as input variables in the estimation of energy and demand savings attributable to the Company's energy efficiency programs. In addition to the billing or consumption analyses, should the Commission desire the use of more utility-specific and Virginia-specific data in the estimation of energy and demand savings attributable to the Company's energy efficiency programs, my testimony provides options for obtaining such data, including measuring a sample of all input variables used in energy savings estimation or measuring a sample of a portion of input variables used in energy savings estimation; and/or submetering all incented measures in a sampling of participating residential applications (see pages 35-46 and 50-56 of this testimony for further discussion of this issue);

- Staff recommends that the Commission provide guidance as to what amount, if any, of deemed input variables can be utilized in estimating energy and demand savings for the results to be considered "utility-specific" or "Virginia-specific," especially for purposes of meeting the measured and verified standard contained within the VCEA (see pages 48-50 of this testimony for further discussion of this issue);

- To the extent the Company seeks to include energy savings attributable to previously-offered programs that have measures with remaining useful lives toward compliance with the energy savings targets contained within the VCEA, Staff recommends, at a minimum, that the Commission direct the Company to audit a sample of these prior installations to ensure that the measures remain installed and operating properly. Should the Commission desire a higher level of rigor for the EM&V of these previously-offered measures, Staff recommends that the Company be directed to include an analysis similar to one of the previously-offered options for the ongoing programs (see pages 66-68 of this testimony for further discussion of this issue);

- After the Company has implemented its Evaluated Savings Approach for each program, as appropriate, Staff recommends that the Company be directed to adjust the savings estimates reported for each program in periods prior to such

implementation based on the results of the Evaluated Savings Approach (see pages 68-70 of this testimony for further discussion of this issue); and

- Staff recommends that the Commission find that an investigation into the Company's annual EM&V reports and determination as to the Company's compliance with the energy savings targets contained within the VCEA should occur as part of a formal proceeding. Staff takes no position on which proceeding or proceedings would be an appropriate venue for such investigation and determination. The Commission may wish to establish a stand-alone proceeding and incorporate this investigation and determination into the Company's annual energy efficiency filings, or some other proceeding, as appropriate (see pages 70-71 of this testimony for further discussion of this issue).

Q81. DOES THIS CONCLUDE YOUR TESTIMONY?

A81. Yes, it does.