COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

AT RICHMOND, JANUARY 17, 2019

PETITION OF

VIRGINIA ELECTRIC AND POWER COMPANY CASE NO. PUR-2018-00100

For approval of a plan for electric distribution grid transformation projects pursuant to § 56-585.1 A 6 of the Code of Virginia

FINAL ORDER

On July 24, 2018, Virginia Electric and Power Company ("Dominion" or "Company") filed a petition ("Petition") with the State Corporation Commission ("Commission") requesting approval of a plan for electric distribution grid transformation projects ("Plan") pursuant to Code § 56-585.1 A 6 ("Section A 6"). Specifically, Dominion seeks approval of the first three years ("Phase I") of a ten-year Plan. Pursuant to Section A 6, the Commission is required to issue its final order on the Petition within six months of the filing date.

The Company states that Phase I includes: (i) advanced metering infrastructure ("AMI"); (ii) customer information platform ("CIP"); (iii) reliability and resilience measures that include intelligent grid devices, operations and automated control systems, and grid hardening; (iv) telecommunications infrastructure; (v) cyber and physical security; (vi) predictive analytics; and (vii) emerging technology.[1]

On July 26, 2018, the Commission issued an Order for Notice and Hearing in this proceeding that, among other things, established a procedural schedule; set an evidentiary

[1] Ex. 2 (Petition) at 4.

hearing date; directed Dominion to provide public notice of its Petition; and provided any interested person an opportunity to file comments on the Company's Petition, or to participate in the case as a respondent by filing a notice of participation. Notices of participation were filed by Appalachian Power Company ("APCo"); Appalachian Voices ("Environmental Respondents"); the Sierra Club ("Sierra Club"); the Board of Supervisors of Culpeper County, Virginia ("Culpeper County"); the Virginia Poverty Law Center ("VPLC");[2] and the Virginia Office of the Attorney General, Division of Consumer Counsel ("Consumer Counsel").

The Commission's Order for Notice and Hearing also provided for the pre-filing of testimony and exhibits by Dominion, respondents and the Commission's Staff ("Staff"). The Company, Environmental Respondents, Consumer Counsel and Staff pre-filed testimony in this proceeding. On August 20, 2018, the Commission issued an Order Scheduling Oral Argument, which established a date for the filing of briefs on legal issues raised by the Company's Petition and scheduled oral argument thereon. On September 13, 2018, the Commission issued an Order specifying issues that should be addressed in the legal briefs. Legal briefs were filed by Dominion, APCo, Environmental Respondents, Sierra Club, Consumer Counsel and Staff.

On November 7, 2018, the Commission received oral argument from participants as scheduled. The evidentiary public hearing in this case was held on November 14 and 27-28, 2018, in which the Commission received evidence and argument from Dominion, Environmental Respondents, Sierra Club, Consumer Counsel, and Staff. The Commission also received testimony and written and electronic comments from public witnesses in this proceeding.

[2] VPLC withdrew its notice of participation on November 9, 2018.

NOW THE COMMISSION, having considered the record, the pleadings, and the applicable law, is of the opinion and finds as follows.

Code of Virginia

As amended by the Grid Transformation and Security Act ("GTSA"),[3] Code § 56-576 defines an "electric distribution grid transformation project" to:

> mean[] a project associated with electric distribution infrastructure, including related data analytics equipment, that is designed to accommodate or facilitate the integration of utility-owned or customer-owned renewable electric generation resources with the utility's electric distribution grid or to otherwise enhance electric distribution grid reliability, electric distribution grid security, customer service, or energy efficiency and conservation, including advanced metering infrastructure; intelligent grid devices for real time system and asset information; automated control systems for electric distribution circuits and substations; communications networks for service meters; intelligent grid devices and other distribution equipment; distribution system hardening projects for circuits, other than the conversion of overhead tap lines to underground service, and substations designed to reduce service outages or service restoration times; physical security measures at key distribution substations; cyber security measures; energy storage systems and microgrids that support circuit-level grid stability, power quality, reliability, or resiliency or provide temporary backup energy supply; electrical facilities and infrastructure necessary to support electric vehicle charging systems; LED street light conversions; and new customer information platforms designed to provide improved customer access, greater service options, and expanded access to energy usage information.

As amended by the GTSA, Section A 6 directs that:

> A utility shall, without regard for whether it has petitioned for any rate adjustment clause pursuant to clause (vi), petition the Commission, not more than once annually, for approval of a plan for electric distribution grid transformation projects. Any plan for

[3] 2018 Va. Acts of Assembly, ch. 296 (a/k/a "Senate Bill 966").

> electric distribution grid transformation projects shall include both measures to facilitate integration of distributed energy resources and measures to enhance physical electric distribution grid reliability and security. In ruling upon such a petition, the Commission shall consider whether the utility's plan for such projects, and the projected costs associated therewith, are reasonable and prudent. Such petition shall be considered on a stand-alone basis without regard to the other costs, revenues, investments, or earnings of the utility; without regard to whether the costs associated with such projects will be recovered through a rate adjustment clause under this subdivision or through the utility's rates for generation and distribution services; and without regard to whether such costs will be the subject of a customer credit offset, as applicable, pursuant to subdivision 8 d. The Commission's final order regarding any such petition for approval of an electric distribution grid transformation plan shall be entered by the Commission not more than six months after the date of filing such petition.

Section A 6 further declares that "[e]lectric distribution grid transformation projects are in the public interest."

With regard to two legal matters of first impression, all parties filing legal memoranda and Staff agree that the Commission may approve or disapprove the Plan in whole or in part.[4] All parties and Staff also agree that the statutory requirement that the costs of a grid transformation plan must be reasonable and prudent is neither nullified by, nor subordinated to, the statutory declaration elsewhere that grid transformation projects in general are in the public interest.[5] We agree with these conclusions.

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[4] *See, e.g.*, Dominion Legal Memorandum at 10; APCo Legal Memorandum at 4; Environmental Respondents Legal Memorandum at 8-9; Sierra Club Legal Memorandum at 7; Consumer Counsel Legal Memorandum at 10-11; Staff Legal Memorandum at 12-13; Tr. 38.

[5] *See, e.g.*, Dominion Legal Memorandum at 11; APCo Legal Memorandum at 4-5; Environmental Respondents Legal Memorandum at 9-10; Sierra Club Legal Memorandum at 8; Consumer Counsel Legal Memorandum at 11-16; Staff Legal Memorandum at 13-14; Tr. 39, 147.

Dominion's proposed Plan is expensive, so it is important that Dominion's customers receive adequate benefit for the costs they will bear in their monthly bills. If the total Plan were approved, the cost to customers – the lifetime revenue requirement of these investments – will be approximately $6.0 billion, including financing costs, to be recovered from customers over the lives of the various components that range from five to 55 years.[6]

The Plan is large and multi-faceted and many elements are not necessarily related to others, so below we consider the Plan's elements in four major categories of related elements. These categories and the costs of each are as follows: (i) Cyber and Physical Security and Telecommunications (total costs: $910.3 million; Phase I costs: $154.5 million); (ii) Advanced Metering Infrastructure and related elements (total costs: $1.3 billion; Phase I costs: $696.8 million); (iii) Intelligent Grid Devices, Operations and Automated Control Systems, and Emerging Technology (total costs: $776.0 million; Phase I costs: $157.5 million); and (iv) Grid Hardening (total costs: $3.0 billion; Phase I costs: $486.1 million).[7]

After consideration of the entire record,[8] we find that Dominion has proven that the costs of the elements in the Cyber and Physical Security category are reasonable and prudent and are approved, as well as some of the Telecommunications elements. We find that Dominion has not

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[6] *See, e.g.*, Ex. 18 (Myers Direct) at 5-22. The total costs of Phase I as proposed herein will be approximately $1.5 billion, including financing costs, to be recovered from customers over the lives of the various components that range from five to 55 years.

[7] *Id.* at 5, 14 (including financing costs).

[8] *See Board of Supervisors of Loudoun County v. State Corp. Comm'n*, 292 Va. 444, 454 n.10 (2016) ("We note that even in the absence of this representation by the Commission, pursuant to our governing standard of review, the Commission's decision comes to us with a presumption that it considered all of the evidence of record.") (citation omitted).

proven that the costs for the Plan elements in categories (ii), (iii), and (iv) are reasonable and prudent. These parts of the Plan are not approved. This disapproval is without prejudice and Dominion may re-file for approval of certain elements in a future proposed plan that complies with the requirements set forth below.

In making these determinations, the Commission has followed all applicable statutory provisions. With regard to those elements that have not been approved, we agree with Consumer Counsel that as a general matter "the plan as filed is significantly lacking in detail with respect to the proposed investments."[9] Also with regard to the Plan in general, we agree with Environmental Respondents Witness Golin who stated, "As a complete package, the [grid transformation] Plan is not cost-effective and will result in an economic loss for all customers."[10] While we find the Plan elements related to Cyber and Physical Security are well-conceived, well-supported and cost-effective, we find that the remaining Plan elements, which will cost customers hundreds of millions of dollars, are not. We explain further below, based on the evidence in this record and taking each category *seriatim.*

Cyber and Physical Security and Telecommunications

The Company proposes Cyber and Physical Security spending of $35.2 million for Phase I ($106.9 million over ten years) (including financing costs). As part of this component of the Plan, among other things, the Company proposes to improve the security at certain distribution substations through upgraded physical barriers, more restricted access control,

[9] Tr. 148.

[10] Ex. 16 (Golin Direct) at 4. Witness Golin also testified, "The analysis used by the Company to justify the [grid transformation] Plan is deeply flawed and indefensible." *Id.*

backup power, and additional sensor systems to provide improved monitoring and alarm capabilities.[11] The Company also proposes Telecommunications-related spending of $119.2 million ($803.4 million over ten years) (including financing costs). The record reflects that the Phase I Security component will be facilitated by proposed investments categorized by the Company to be part of its proposed Phase I Telecommunications component.[12]

No party took issue with the Company's proposed Phase I Security component[13] and the Commission generally supports reasonable utility spending to support enhanced utility security. Under the circumstances of this case and based on the evidence in the record, the Commission finds reasonable and prudent the costs of the Company's proposed Phase I Cyber and Physical Security and Telecommunications proposals, with the exception of the proposed spending that is related exclusively to components of the Plan that are not approved herein, such as the AMI-related components. Such spending is not reasonable and prudent and is not approved.[14]

Advanced Metering Infrastructure and Related Plan Elements

Dominion proposes to spend $523.8 million in Phase I ($824.4 million over ten years) (including financing costs) to deploy AMI ("smart meters") throughout its service territory.

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[11] Ex. 17 (Essah Direct) at 39.

[12] *See, e.g.*, Ex. 12 (Walker Direct) at 2, 8; Tr. 165 (Company witness Baine testified that "these [Telecommunications] investments are to enhance physical and cyber security supporting our business as well"); Tr. 571 (Company witness Engels testified that "the telecommunications infrastructure is critical to . . . providing that information to our cyber security operations center, as well as our physical security operations center . . . .").

[13] Ex. 14 (Norwood Direct) at 16-17; Ex. 16 (Golin Direct) at 3; Tr. 263-264; Tr. 337; Tr. 430.

[14] Company witness Engels testified that some AMI-related costs are included in the proposed Phase I Security component of the Plan, but was unable to separately identify the amount of such AMI-related spending. Tr. 574. The Commission directs the Company to separately track approved spending and to maintain documentation to facilitate Staff audit to ensure such spending is not related to unapproved components of the Plan.

Connected to its AMI proposal, Dominion also proposes to spend $157.0 million ($402.9 million over ten years) (including financing costs) on deployment of a Customer Information Platform, or CIP, and an additional $16.0 million ($36.0 million over ten years) (including financing costs) on Predictive Analytics.[15] Further, as noted above, an unspecified portion of the costs of other elements of this Petition are also connected to deployment of AMI. Consequently, AMI and related elements represent one of the costliest components of Dominion's Petition.

While supportive of the goals of AMI technology, the Sierra Club, Environmental Respondents and Consumer Counsel all oppose Dominion's AMI proposal as not adequately developed and therefore neither reasonable nor prudent as to costs and benefits.[16] For example, Environmental Respondents Witness Golin testified, "[AMI and related technologies] are beneficial and cost-effective *only to the extent* the Company utilizes them *to maximize* the potential gains of rate optionality, energy efficiency, demand response, and DERs [distributed energy resources ("DERs")]."[17] Witness Golin concludes, however, that "[t]he Company *does not have plans* to fully optimize the Smart Metering proposed ..." and "[w]ithout a well-reasoned plan, this expensive equipment could be under-utilized and provide little to no benefit to customers and the utility."[18] We agree.

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[15] Ex. 18 (Myers Direct) at 5. Based on the record developed herein, we find it reasonable to consider these three components together. For example, Environmental Respondents witness Golin testified that the CIP is necessary for customers to be educated about AMI, to have access to data to enable the benefits of AMI, and to engage with the tariff designs enabled by AMI. Tr. 313. Company witness Wright also testified that predictive analytics would be monitoring AMI meters for anomalies. Tr. 495.

[16] *See, e.g.*, Ex. 14 (Norwood Direct) at 20, 25; Tr. 139, 143-44, 146.

[17] Ex. 16 (Golin Direct) at 25-26 (emphases added).

[18] *Id.* at 28.

Equally important, the proposal is lacking in detailed cost information with respect to many AMI-related components of the Plan. For example, the record reflects that the proffered cost estimates in connection with the CIP are high level planning estimates based on a preliminary draft timeline.[19] In addition, the record reflects that the Company has not yet selected specific vendors for the CIP and that the Company plans to, but has not yet, issued "numerous" requests for proposal regarding the CIP.[20] The Company also acknowledged that the actual costs of the CIP could be either higher or lower than the projections contained in the filing.[21]

A finding of prudence under the GTSA for a specifically-identified cost in large measure commits ratepayers to footing the bill.[22] In fact, as emphasized by Consumer Counsel, the GTSA specifically states that the Commission "shall" permit recovery "with respect to all costs deemed reasonable and prudent by the Commission" in a triennial review proceeding.[23] This necessitates more than a cursory review of the Plan in a proceeding such as this. Rather, detailed, accurate, and reasonable cost information attendant to these projects is needed to evaluate whether they are reasonable and prudent before we commit customers to pay for the Company's proposals.

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[19] Ex. 18 (Myers Direct) at 12.

[20] Tr. 208, 473.

[21] Tr. 207.

[22] As testified to during the hearing, if a specifically-identified cost is deemed prudent prior to expenditure, it is difficult to deny its recovery in a later rate proceeding. Tr. 421-422.

[23] Tr. 610-611.

Smart meters are costly, but money spent on smart meters – if spent wisely and effectively – is money spent to enable customers to save money by reducing energy usage at peak times (demand response) and reducing overall usage (energy efficiency and conservation). Cost-effective spending on smart meters can also support other goals of a sound grid transformation plan, including greater deployment and integration of DERs such as rooftop solar, and system-wide reductions of carbon emissions.

As Environmental Respondents, Sierra Club and Consumer Counsel point out, Dominion has failed to include in its Petition a well-developed and comprehensive plan to maximize the potential of AMI.[24] Dominion promises to do so in the future,[25] but it asks us to approve hundreds of millions of dollars in spending on smart meters *now,* money Dominion will ultimately seek to recover from its customers in one form or another.[26] This we will not do. Rather, we find that, since the record proves that Dominion's Petition lacks a sound plan to maximize the potential of AMI, the cost of its Plan is therefore not reasonable and prudent with regard to the AMI-related elements of its Petition.

This finding is without prejudice, and Dominion may re-file a more fully developed AMI proposal in a future grid transformation filing. If Dominion chooses to proceed with a proposal for full deployment of AMI, its next proposal should be supported by a detailed and comprehensive plan for evaluation that addresses, at a minimum, the following elements:

a. Detailed cost estimates for all AMI-related spending.

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[24] *See, e.g.*, Tr. 146, 148, 281-85, 604.

[25] *See, e.g.*, Ex. 33 (Baine Rebuttal) at 10-12; Tr. 25, 28, 176.

[26] Tr. 167, 634.

b. Any plan for time-varying rates; and whether any such offering would be the default tariff for a customer with an installed smart meter.

c. Any customer "opt-out" provision,[27] both as to smart meter installation and time-varying rates,[28] under all tariff scenarios for those consumers who so choose and to protect particularly vulnerable customers, such as those with medical conditions that reduce their ability to manage energy usage; and any fees proposed by the Company to be charged to customers who choose to opt-out both as to time-varying rates and smart meter installation.

d. Analysis of how any plan promotes demand response, energy efficiency, and conservation.

e. A transition plan including adequate customer education.

Such an amended plan will, of course, be evaluated on its own merits as to its various features and as to the reasonableness and prudence of its costs when the full record is developed in a future proceeding, one in which all interested parties and persons will have the opportunity to participate as either respondents or to offer testimony as public witnesses or offer public comment.

Intelligent Grid Devices, Operations and Automated Control Systems and Emerging Technology

Dominion proposes to spend $104.6 million in Phase I ($627.5 million over ten years) (including financing costs) on Intelligent Grid Devices.[29] The Company also proposes to spend $42.7 million in Phase I ($108.4 million over ten years) (including financing costs) on Operations and Automated Control Systems and $10.3 million ($40.2 million over ten years)

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[27] Evidence from other states demonstrates that purely "opt-in" tariffs result in extremely low participation rates. Tr. 205-06.

[28] Smart meters are necessary to implement time-varying rates; accordingly, opting out of smart meter installation will also result in opting out of time-varying rates.

[29] Ex. 18 (Myers Direct) at 14.

(including financing costs) on Emerging Technology.[30] The Company asserts that "these intelligent grid devices will be deployed with the associated telecommunication network and operation and automated control systems to achieve improved reliability and resiliency while supporting DER integration by actively managing power flow on the grid and informing long-term load planning activities."[31] The Sierra Club, Environmental Respondents and Consumer Counsel do not support the Phase I Intelligent Grid Devices and Operations and Automated Control Systems proposals.[32] Environmental Respondent's witness Golin, for example, states that these investments appear to be premature based on the current level of DER penetration in the Company's service territory and the proposed functionality set out in the Plan.[33] In this regard, the record reflects that (i) DER penetration levels (customer-sited and utility-scale solar) are less than 1% of peak load and fewer than 1% of all customers have DERs,[34] and (ii) the Company has not experienced any documented instances of the intermittent output of DER causing voltage stability or reliability problems for the Company's system.[35] Environmental Respondents' witness Golin testified that "by investing in infrastructure before it

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[30] *Id.* at 5, 14. We find it reasonable to consider these three components together. For example, according to Company witness Wright, the Operations and Automated Control Systems will control and manage the intelligent grid devices. Ex. 8 (Wright Direct) at 13. In addition, the majority of the costs associated with Emerging Technology relate to deployment of specific intelligent grid devices on Company-owned streetlights. Ex. 4 (Crable Direct) at 37.

[31] Ex. 8 (Wright Direct) at 8.

[32] *See, e.g.*, Ex. 14 (Norwood Direct) at 26; Ex. 16 (Golin Direct) at 40; Tr. 143-44.

[33] Ex. 16 (Golin Direct) at 24, 40-41.

[34] *Id.* at 40.

[35] *Id.* at CG-50.

is necessary, the Company . . . runs the risk of obsolescence."[36] The record further reflects that these investments will not decrease the costs of interconnecting DERs, nor will they allow utilization of additional DER functionality.[37]

The record is also substantially lacking in cost estimates related to these investments.[38] Based on the record developed in this proceeding, the Commission finds that Phase I Intelligent Grid Devices, Operations and Automated Controls Systems, and Emerging Technology proposals are not reasonable and prudent.

Grid Hardening

Dominion proposes to spend $486.1 million in Phase I ($3.0 billion over ten years) (including financing costs) on Grid Hardening, making it the largest single component of the Company's ten-year Plan. As part of Grid Hardening, the Company proposes, among other things, to replace and rebuild targeted main feeder segments and to implement new vegetation management programs.[39] The Sierra Club, Environmental Respondents and Consumer Counsel all oppose the Grid Hardening element of the Plan.[40] These respondents question, among other things, the need for grid hardening on this scale and the basis for the proffered cost estimates, which are very high.[41] For example, Consumer Counsel witness Norwood testified that "[t]he

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[36] *Id.* at 41. Dr. Golin also questioned whether the anticipated reliability improvements from these investments have been shown to be cost-effective. *Id.* at 36.

[37] *Id.* at 42.

[38] Ex. 18 (Myers Direct) at 14-16.

[39] Ex. 8 (Wright Direct) at 19.

[40] *See, e.g.*, Ex. 16 (Golin Direct) at 45-50; Ex. 14 (Norwood Direct) at 20, 26; Tr. 143-44.

[41] *See, e.g.*, Ex. 16 (Golin Direct) at 47; Ex. 14 (Norwood Direct) at 20.

level of these existing grid hardening investments, along with the Company's existing high distribution service reliability and few customer complaints, calls into question the need for Dominion's proposal to invest another $2 billion over the next 10 years for the grid hardening and resiliency portion of the [grid transformation] Plan."[42] Environmental Respondent's witness Golin also testified the Company has failed to "present[] an itemized list of how it will spend customer money on grid hardening activities, nor has it provided a specific purpose for each investment . . . ."[43] The record reflects in this regard that, while the Company identifies five subcomponents of the Grid Hardening proposal, it has not yet identified what portion of the requested spending will relate to each subcomponent.[44] Nor has it identified the number of miles of main feeders that it proposes to underground, an investment that the Company asserts costs, on average, $2.5 million per mile.[45]

Moreover, the Company has failed to show a level of benefits commensurate with the projected costs. For example, by the Company's own estimation, Phase I is projected to eliminate approximately 5 minutes of service interruption per customer annually at a cost of $267.7 million (not including financing costs).[46] The Commission is also cognizant that while the costs of Grid Hardening will ultimately be borne by all customers, it will benefit only a small fraction of the Company's customers. The record reflects that only approximately 4.3% of the

[42] Ex. 14 (Norwood Direct) at 20.

[43] Ex. 16 (Golin Direct) at 47.

[44] Ex. 10.

[45] Ex. 17 (Essah Direct) at 36; Ex. 23 (Wright Rebuttal) at 28-29; Tr. 551-52.

[46] Ex. 14 (Norwood Direct) at 12; Tr. 511-12.

Company's customers will be served by the distribution feeders targeted for Grid Hardening during Phase I and that these feeders represents just 1.0% of the Company's overhead lines.[47]

Based on the record developed herein, the Commission cannot find that the Company's Phase I Grid Hardening proposal is reasonable and prudent.

Conclusion

In summary, we agree that smart meters and other grid enhancements hold the promise for a true transformation of the grid and for the more efficient consumption of electricity, but spending billions of dollars of customers' money on full deployment is reasonable and prudent only if the expenditure is accompanied by a sound and well-crafted plan to fulfill the promise that smart meter technology and other grid enhancements offer. Our ruling allows Dominion to propose such a plan in the future. We approve herein reasonable spending related to Cyber and Physical Security, including supporting Telecommunications investment, but otherwise do not find the remaining components of the Company's proposed Phase I Plan to be reasonable and prudent based on the record in this proceeding.

Accordingly, IT IS SO ORDERED, and this matter IS DISMISSED.

AN ATTESTED COPY hereof shall be sent by the Clerk of the Commission to all persons on the official Service List in this matter. The Service List is available from the Clerk of the State Corporation Commission, c/o Document Control Center, 1300 East Main Street, First Floor, Tyler Building, Richmond, Virginia 23219. A copy shall also be sent to the Commission's

[47] Ex. 9.

Office of General Counsel and Divisions of Public Utility Regulation and Utility Accounting and Finance.