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July 24, 2018

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Mr. Joel H. Peck, Clerk
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Richmond, Virginia 23219

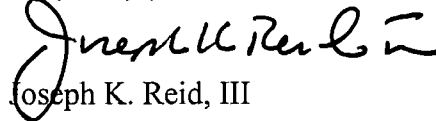
*Petition of Virginia Electric and Power Company,
For approval of a plan for electric distribution grid transformation projects
pursuant to § 56-585.1 A 6 of the Code of Virginia
Case No. PUR-2018-00100*

Dear Mr. Peck:

Please find enclosed for filing in the above-captioned proceeding an unbound original and fifteen (15) copies of Virginia Electric and Power Company's Petition and Direct Testimony, consisting of one volume in public version only.

Please do not hesitate to call if you have any questions in regard to the enclosed.

Very truly yours,


Joseph K. Reid, III

Enclosures

cc: William H. Chambliss, Esq.
C. Meade Browder, Jr., Esq.
Lisa S. Booth, Esq.

Robert M. Blue
President and Chief Executive Officer
Power Delivery Group

120 Tredegar Street, Richmond, VA 23219
DominionEnergy.com



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July 24, 2018

Joel H. Peck, Clerk
Virginia State Corporation Commission
C/o Document Control Center
1300 East Main Street
Richmond, VA 23219

RE: Case No. PUR-2018-00100

Dear Mr. Peck:

Virginia Electric and Power Company (“Dominion Energy Virginia” or the “Company”) is pleased to submit to the Virginia State Corporation Commission (“Commission”) its proposed plan to transform its electric distribution grid into a smarter, stronger and greener system that will meet the expectations of our customers. The Grid Transformation Plan (the “GT Plan” or the “Plan”) filing was authorized by the Grid Transformation and Security Act of 2018 (“GTSA”), which was approved by the Virginia General Assembly and signed into law on March 9, 2018 by Governor Ralph Northam, with an effective date of July 1, 2018. The GTSA represents an important policy statement by the Commonwealth by recognizing the importance of transformational change in the electric distribution system, identifying investments in such transformational changes as being in the public interest, and requiring electric utilities to seek Commission approval for any plans to do so.

The Grid Transformation Plan presented today represents the first three years (“Phase I”) of the Company’s proposed 10-year program to enhance the reliability, resiliency and security of the electric distribution grid, improve service for customers, and provide them with more options for communications and control as well as tools for managing their energy use. The Plan will also facilitate the integration of distributed energy resources (“DER”), such as solar or battery storage, into the system. While the Grid Transformation Plan outlines a proposed 10-year initiative, the Company is only seeking Commission approval for Phase I, covering years 2019-2021. Dominion Energy Virginia asks the Commission to approve its petition (the “Petition”) for Phase I and find that the programs included in Phase I and their associated costs are reasonable and prudent. In future filings, the Company will update the Grid Transformation Plan and seek Commission approval of forecasted costs for the later years of the Plan. Dominion Energy Virginia envisions the Plan to proceed in interdependent phases, with each phase building upon the last.

The Need for Grid Transformation

Throughout its history, Dominion Energy Virginia has focused on providing safe, reliable and environmentally responsible service to its customers at just and reasonable rates. The Company believes it has succeeded in meeting these goals. Our rates compare favorably to our peer utilities and to a variety of regional and national averages. Our reliability and customer service have consistently improved; for example, the number of minutes the average customer lacks service annually has decreased significantly over the past decade.

Despite this record of performance, there is wide recognition that the distribution grid, not only in Virginia but throughout the nation, needs to be modernized and strengthened to reflect the fundamental changes in customer expectations for the electric industry as well as changes in the industry itself. While customers have always demanded high levels of reliability, the needs of modern homes and businesses for uninterrupted service have greatly increased. Consumers of all sizes are becoming progressively more dependent on electronic devices and equipment for the basic components of daily life, including communications, education, healthcare, commerce and transportation. While service interruptions have always been an inconvenience, the safe and reliable delivery of power has never been more important than it is today.

Customer expectations have also evolved. In addition to expecting high levels of reliability, customers today want more communications channels that provide more information about their energy use and options for managing and controlling it. Guided by their experience with retailers and other online companies, customers expect routine functions such as bill payment and service connections and disconnections to be easy and convenient.

The existing grid is also faced with new and expanding challenges. It was originally designed to facilitate one-way power flows, from dispatchable, centralized generating stations through the transmission and distribution systems to end-use customers. However, the distribution grid today cannot effectively integrate the ever-increasing amount of renewable generation, including customer-level DER. Nor can today's grid accommodate all the demands of new technologies such as electric vehicles and their charging systems. And the grid faces the ever-present threat of physical and cyber-attack at levels unimagined just a few years ago.

Fortunately, technology has evolved to meet these expectations and challenges, allowing utilities nationwide to modernize their grids through cost-effective measures and controls and to expand their use of digital systems such as smart meters and intelligent grid devices. The Company incorporated lessons learned from other utilities together with analysis of its own distribution system to develop its Grid Transformation Plan.

Major Elements of the Grid Transformation Plan

The Plan presented today involves a series of transformative improvements.

- **Smart Meters**

First, the Plan calls for full deployment of digital smart meters and their supporting network infrastructure throughout Dominion Energy Virginia's service area. The Plan calls for over 1.4 million smart meters to be installed during Phase I (2019-2021) with over 600,000 installed during 2022-2023. Smart meters capture a wide range of data in specified increments, including consumption, demand and voltage, and communicate this information to a centralized Company location via a telecommunications network. Full deployment of smart meters is a foundational component of the GT Plan, enabling a wide range of other Plan components, such as improved customer service, better grid reliability, integration of renewables and enhanced system security.

Through smart meters and their supporting telecommunications devices, a system collectively known as advanced metering infrastructure or "AMI," the Company can send remote commands, inquiries and upgrades to individual devices, minimizing the need for field visits by Company personnel and enabling functions such as connection and disconnection to be performed remotely. The technology will allow the Company to identify outages more rapidly and precisely, leading to faster restoration after both small disruptions and widespread events caused by major storms.

Smart meters will also provide the Company with improved ability to detect and more efficiently locate problems on the distribution grid such as abnormal usage and voltage. The information will support a wide range of functions to enhance grid management and reliability as well as managing voltage fluctuations when more DER are integrated into the grid. In deploying smart meters, Dominion Energy Virginia will use the lessons learned during the Company's installation of about 400,000 of the devices in selected areas since 2009. This project provided Dominion Energy Virginia with a wealth of information on AMI technology, its deployment and operation, and its benefits for both the Company and customers.

- **Customer Information Platform**

The Plan also calls for deployment of a modern digital customer information platform ("CIP") enabling a wide range of new capabilities and customer services and greatly expanding customer opportunities to interact with the Company through their digital devices. The transition to the new CIP will begin during Phase I of the Plan.

The new CIP will provide customers with access to detailed energy usage information based on data gathered from smart meters. This platform will enable customers to select rate structures that best meet their needs, including time-variable rate options. The CIP will also enable customers to receive high usage alerts from the Company, bringing to their attention unexpected spikes in energy usage at their premises. This will give customers the ability to react quickly by changing their energy use patterns and checking for any equipment malfunctions that may cause safety as well as usage issues.

The CIP will increase the self-service options available for customers, making it easier for them to schedule services such as connection and disconnection, enroll in Company programs, select their billing date, compare rate options and view customized energy consumption analyses. Throughout the process, the Company will focus on educating customers on how they can fully utilize the new capabilities provided by the CIP. Through this element of the GT Plan, the Company will offer customers the streamlined and convenient interactions they have come to expect through their interaction with online retailers and service providers.

- **Improving Grid Reliability and Resiliency**

Beginning with Phase I, the GT Plan includes programs to promote a stronger, more reliable, and more resilient distribution grid. This includes deployment of digital intelligent grid devices, such as line sensors and digital relays, and automated control systems which include an advanced distribution management system, an outage management system, and a distributed energy resources management system. Working together, these devices and systems will provide the grid with self-healing capabilities, automatically isolating system faults and rerouting power flows to restore as many customers as possible with minimal intervention from system operators. The devices and control systems will further enhance reliability by improving system operators' ability to oversee and manage the grid through predicting, identifying, and correcting issues before they escalate into outages or responding faster when outages do occur.

Measures to create a more reliable and resilient system will also include grid hardening activities to physically strengthen infrastructure, and improve the performance and condition of the grid and individual grid components. Specific foundational elements of grid hardening include, among other things, replacing and rebuilding targeted distribution feeder lines, implementing new design and construction standards, implementing new loading standards, and implementing new vegetation management programs. In addition to improving everyday service

reliability and recovery after severe weather events, the proposed hardening initiatives will ensure that the grid is better equipped to accept the growing production of energy from DER.

- **Physical and Cyber Security Measures**

The Company is well aware of its duty to reliably serve its 2.6 million customers in the face of increasing threats of physical or cyber assaults on its assets. It is also well aware of the large number of critical facilities receiving power through its system, including military bases in Virginia and many other important federal, state and local operations. Dominion Energy Virginia has already undertaken programs to address this increasing threat level, and the GT Plan will further increase the grid's physical and cyber security. In addition to the other physical hardening activities outlined in the Plan, the Company will identify specific substations requiring security improvements. The identification will be based on factors including the magnitude and type of customer demand served by the facility; its importance to providing service to critical public services; and the number of customers that would be affected by the asset's failure. Typical improvements are expected to include upgraded physical barriers, more restricted access to substation control houses, and additional monitoring equipment, but will vary from substation to substation.

The Company will also continue to implement strict cyber security standards for all intelligent devices and automated control systems installed, replaced or upgraded under the Plan. All systems that collect information from customers, including data from smart meters or other information obtained through the new CIP, will have strong cyber security components. Information from these intelligent devices and systems will be comprehensively reviewed to detect and prevent any possible cyber intrusions that could threaten the Company and its customers.

- **Promotion of a Greener Grid**

The Plan will also help create a "greener" grid in several ways. The investments made will improve the Company's ability to connect the growing number of DER to the distribution grid and ensure that the units' intermittent output does not pose threats to voltage stability and system operations and reliability. It will also make it easier for customers with DER to apply for connection to the grid and enroll in Company programs. The Plan will also make the grid more adaptable for a range of emerging or growing technologies, including battery storage, electric vehicles, microgrids and smart lighting, with a positive impact on the environment.

- **Analytics Center for Excellence**

Phase I of the Plan calls for creation of an analytics center for excellence. It will enable the Company to better use predictive analytics by processing the massive amounts of data collected by smart meters, other intelligent grid devices, and grid operating systems. Through this analysis, the Company will have an expanded ability to detect and forecast problems, identify malfunctioning equipment, and improve customer service.

- **Telecommunications**

The forward-looking telecommunications strategy within the GT Plan represents essential technology that must be deployed to enable transformation to a true digital grid. In fact, every program proposed in the Plan relies upon a secure two-way network of communications, including field devices (intelligent grid devices and smart meters), operations and automated control systems, and customer options and communications.

The proposed telecommunications strategy will be customized to allow the Company to manage and operate securely and effectively new and existing capabilities across three tiers of needs based on criticality of assets, desired capabilities and controls, and a prudent deployment approach. The first tier includes an upgrade of Dominion Energy Virginia’s existing telecommunications backbone network to meet the needs of the Company’s high-priority infrastructure within its service area, including substations and other key facilities. The second tier includes the extension of high-speed connectivity from tier one to remaining substations and utility facilities identified through a cost-effectiveness analysis. The third tier is the deployment of a field area network to support connectivity to distribution grid equipment and systems not directly served by tiers one and two. These include intelligent grid devices and internal office systems that support advanced distribution operations automation.

Benefits of the GT Plan

The improvements included in the Grid Transformation Plan will increase the reliability and resiliency of the distribution grid, reducing the number and duration of outages through self-healing components and faster Company response to disruptions. It will provide customers with new and detailed information about their energy use and greatly expand customer service options. It will also reduce components of the Company’s cost of service by reducing the number of field visits, decreasing the amount of work needed to restore service, and improving system performance. It will lessen the negative impact on the economy that occurs after outages, especially outages of long duration. By facilitating the integration of renewable energy sources, the GT Plan may also lead to reduced emissions. Further, the investments proposed in the GT Plan will support job creation and economic development in the Commonwealth.

The GT Plan: Prudent Investments for a Smarter, Stronger, Greener Distribution Grid

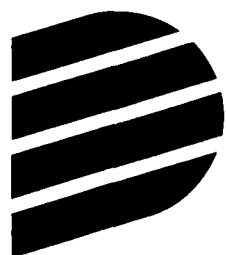
The Company estimates the proposed total capital investment in Phase I of the GT Plan will be approximately \$816.3 million and the proposed operations and maintenance expenses will be approximately \$101.5 million. The Company is seeking approval of only Phase I of the Plan, covering investments for the period 2019-2021.

The Company believes the measures put in place during Phase I will enhance the reliability and security of the grid, meet the rising needs and expectations of our customers, and help protect the environment by supporting the integration of units powered by emissions-free renewable energy, including DER.. The Company respectfully requests the Commission to find the programs and costs included in Phase I to be both reasonable and prudent.

Sincerely,



Robert M. Blue



**Dominion
Energy[®]**

**Petition and Direct Testimony
of Virginia Electric and Power
Company**

**Before the State Corporation
Commission of Virginia**

**Petition of Virginia Electric and
Power Company, For approval of
a plan for electric distribution grid
transformation projects pursuant
to § 56-585.1 A 6 of the Code of
Virginia**

Case No. PUR-2018-00100

Filed: July 24, 2018

Volume 1 of 1

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION

PETITION OF)
)
VIRGINIA ELECTRIC AND POWER COMPANY)
)
For approval of a plan for electric distribution grid)
transformation projects pursuant to § 56-585.1 A 6)
of the Code of Virginia)

Case No. PUR-2018-00100

PETITION OF VIRGINIA ELECTRIC AND POWER COMPANY

Pursuant to § 56-585.1 A 6 (“Subsection A 6”) of the Code of Virginia (“Va. Code”) and Rule 80 A of the Rules of Practice and Procedure of the State Corporation Commission of Virginia (the “Commission”), 5 VAC 5-20-80 A, Virginia Electric and Power Company (“Dominion Energy Virginia” or the “Company”), by counsel, hereby files its petition for approval of a plan for electric distribution grid transformation projects (the “Petition”). Specifically, Dominion Energy Virginia asks for approval of the first three years (“Phase I”) of its ten-year plan to transform its electric distribution grid (the “Grid Transformation,” the “GT Plan,” or the “Plan”).

In support of this Petition, the Company respectfully states as follows:

I. General Information

1. Dominion Energy Virginia is a public service corporation organized under the laws of the Commonwealth of Virginia furnishing electric service to the public within its certificated service territory. The Company also supplies electric service to non-jurisdictional customers in Virginia and to the public in portions of North Carolina. The Company is engaged in the business of generating, transmitting, distributing, and selling electric power and energy to the public for compensation. The Company is a public utility under the Federal Power Act, and certain of its operations are subject to the jurisdiction of the Federal Energy Regulatory Commission. The Company is an operating subsidiary of Dominion Energy, Inc. (“Dominion Energy”).

2. The Company's name and post office address are:

Virginia Electric and Power Company
120 Tredegar Street
Richmond, Virginia 23219

3. The names, addresses, and telephone numbers of the Company's attorneys are:

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Audrey T. Bauhan
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II. Legal Authority

4. Subsection A 6, as amended by the Grid Transformation and Security Act of 2018 (the "GTSA"), requires the Company to petition the Commission for approval of a plan for electric grid transformation projects:

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 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.

5. Va. Code § 56-576 defines an “electric distribution grid transformation project” as follows:

“Electric distribution grid transformation project” means 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.

6. Subsection A 6 sets forth the standard for Commission review of a plan for electric distribution grid transformation projects:

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.

7. In accordance with Subsection A 6, the Commission must issue its final order on a petition for approval of an electric distribution grid transformation plan not more than six months after the date of filing the petition.

III. The Company's Grid Transformation Plan

8. Dominion Energy Virginia has created a ten-year plan to transform its electric distribution grid into a smarter, stronger, and greener grid. The Company envisions the Grid Transformation Plan to proceed in interdependent phases, with each phase building upon the last.

9. During Phase I of the Plan, the Company will focus on seven components of the overall Grid Transformation Plan, many of which are foundational to a transformed grid: (i) smart meters; (ii) customer information platform; (iii) reliability and resilience; (iv) telecommunications infrastructure; (v) cyber and physical security; (vi) predictive analytics; and (vii) emerging technology.

10. The Company proposes to fully deploy smart meters and their supporting network infrastructure ("AMI") across its service territory, including 2.1 million smart meters and 7,000 network devices. During Phase I, the Company estimates that it will deploy over 1.4 million smart meters, touching all regions of its service territory. In future phases of the GT Plan, the Company will implement a new meter data management system to support the increased density of smart meters. Through AMI, the Company can remotely read and send commands, inquiries, and upgrades to individual smart meters, minimizing the need for field visits. The technology will also allow the Company to identify outages rapidly and precisely, leading to faster restoration after both small disruptions and widespread events caused by major storms.

11. The Company also proposes to develop and deploy a new customer information platform ("CIP"), replacing its over twenty year-old customer information system. The CIP will

be a framework of technologies and applications that together will deliver comprehensive customer information and streamlined transactions, as well as multi-channeled engagement between Dominion Energy Virginia and its customers. The CIP will improve the customer experience by providing scalable services that are flexible and adaptable to all customers; enabling the Company to offer customers new scalable rate structures, expanded self-service options, and more customer-centric initiatives; expanding customer communication channels that will provide customers with a dynamic and personalized experience; and enabling the delivery of multi-language support.

12. To improve reliability and resilience, the Company proposes to (i) deploy intelligent grid devices, (ii) implement operations and automated control systems, (iii) perform grid hardening activities, and (iv) implement physical security measures at certain substations. These investments that will leverage technology, new equipment, and new standards to make the Company's electric distribution grid more reliable, resilient, self-healing, adaptive to renewables, and secure.

13. The Company proposes to deploy a foundational, forward-looking telecommunications strategy and solution as a critical and interdependent component of the GT Plan. In doing so, the Company proposes a three-tiered strategy consisting of multiple components specifically designed and deployed as an integrated solution to meet the wide-range needs of a modernized electric grid.

14. Also foundational to the Grid Transformation Plan are cyber and physical security measures. The Company's proposed approach is designed to reduce the likelihood and impact of cyber or physical attacks.

15. The Company also proposes a comprehensive strategy for predictive analytics to sustain utility and customer benefits and unlock current and future grid benefits with respect to the GT Plan. This strategy centers on the creation and operation of the analytics center of excellence comprised of a data analytics system and supporting organization.

16. As part of the Grid Transformation Plan, the Company will monitor emerging technologies and propose investments where reasonable and prudent. In this filing, the Company is proposing to begin its Smart Lighting Initiative and to deploy a streamlined net metering application process. Through the Smart Lighting Initiative, the Company intends to mount intelligent grid devices on certain Company-owned streetlights. The Company also proposes to deploy a streamlined net metering application process, leading to reduced application processing times and improved visibility for customers into their application status. As to other emerging technologies, the Company will continue to monitor and evaluate prudent investments related to a microgrid demonstration project and electric vehicle support.

17. All components of the Grid Transformation Plan are interrelated, interdependent, and necessary to achieve the maximum benefit from all of the proposed investments.

IV. Phase I of the GT Plan is Reasonable and Prudent and in the Public Interest

18. Phase I of the GT Plan includes both measures to facilitate integration of distributed energy resources and measures to enhance physical electric distribution grid reliability and security as required by Va. Code § 56-585.1 A 6.

19. The benefits of the Grid Transformation Plan fall into three primary categories: (i) increased reliability and resiliency; (ii) improved customer experience; and (iii) reduced components of cost of service.

20. As to increased reliability and resiliency, the proposed investments will eliminate outage events, reduce the number of customers affected, and allow for faster restoration. Improved grid reliability equates to improved grid availability to receive and transmit the output of distributed energy resources, such as rooftop solar. Increased cyber and physical security will also reduce the likelihood of a successful cyber and physical attack.

21. The Grid Transformation Plan will also improve the customer experience by allowing customers to select from an expanded set of digital communication channels. The digital communication channels will enable secure, streamlined, and convenient interactions between the customers and the Company. The new channels will also simplify transactions such as bill payment, rate and program selections, and program enrollment and de-enrollment. The GT Plan will also enable the Company to offer customers new rate structures and expanded self-service.

22. The GT Plan will reduce components of cost of service over time. Operational benefits include field labor savings, better management of energy diversion, and better management of bad debt.

23. Beyond these primary benefits, the GT Plan will likely lead to other societal benefits, such as reduced emissions, job creation, and economic development.

24. The forecasted total proposed investment associated with Phase I of the Grid Transformation Plan is \$816.3 million in capital investment and \$101.5 million in operations and maintenance investment. The supporting testimony submitted with this application provides a breakdown of this number among the components of the GT Plan.

25. The proposed investments are reasonable, prudent, and necessary to meet the needs of the Company's customers, both now and for many years to come.

26. Subsection A 6 states that “[e]lectric distribution grid transformation projects are in the public interest.”

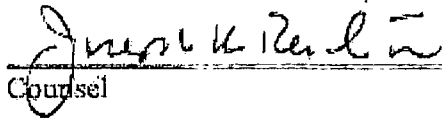
V. Conclusion

27. Pursuant to Va. Code § 56-585.1 A 6, the Company is seeking approval of Phase I of its Grid Transformation Plan. In support of its Petition, the Company submits the pre-filed direct testimonies of Company Witnesses Edward H. Baine, Brett A. Crable, Franklin M. Hinckle, Jr., Robert S. Wright, Jr., Joseph A. Walker, and Mark A. Engels

28. For the reasons set forth in the Petition and the supporting testimony, Phase I of the Grid Transformation Plan and the associated costs are reasonable and prudent.

WHEREFORE, the Company respectfully requests that the Commission: (i) approve Phase I of the Grid Transformation Plan as reasonable and prudent within six months of the date of this filing; and (ii) grant such other relief as deemed appropriate and necessary.

Respectfully submitted,

By: 
Counsel

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Counsel for Virginia Electric and Power Company

July 24, 2018