THE PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

Formal Case No. 1130, Modernizing the Energy Delivery System for Increased Sustainability

MEDSIS Staff Report

January 25, 2017

EXECUTIVE SUMMARY

The investigation into modernizing the energy delivery system in the District of Columbia was initiated in response to intervenors' requests in both Formal Case No. 1103 (Pepco's last base rate case)[1] and Formal Case No. 1123 (Pepco's Notice of Construction ("NOC") for a new substation).[2] In consideration of intervenor requests, technological advancements in the energy industry, and changing consumer preferences,[3] on June 12, 2015, the Commission issued Order No. 17912 which opened this proceeding to identify technologies and policies that can be implemented in the District to modernize the distribution energy delivery system for increased sustainability ("MEDSIS"); and, in the near-term, to make the distribution energy delivery system more reliable, efficient, cost effective, and interactive.[4]

The major goal of this MEDSIS Staff Report is to both identify the barriers to modernization of the energy delivery system that existing rules and regulations in the District present and to then provide actionable solutions to removing these barriers in a manner that comports with the Commission's statutory duties and the District's goal of promoting a clean energy economy.

Section I of the MEDSIS Staff Report ("MEDSIS Report," "Staff Report," or "Report") introduces the MEDSIS Initiative and lays out the Commission's statutory authority to regulate public utilities doing business in the District of Columbia to ensure the safe, reliable, and affordable provision of service to District ratepayers. Staff then discusses the District's restructured energy market, critical infrastructure concerns, as well as clarifies Staff's role in authoring this Report and advising the Commission in multiple capacities.

In **Section II** of the Report, Staff discusses the specific and differentiating characteristics of the District's energy delivery system and touches on grid modernization efforts in other jurisdictions that Staff is actively monitoring. Staff recognizes that we need District specific solutions to the issues our modernization efforts present. For

1 *See Formal Case No. 1103, In the Matter of the Application of the Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service* ("*Formal Case No. 1130*"), Order No. 17539, at ¶ 120, rel. July 10, 2014 ("Order No. 17539").

2 *Formal Case No. 1123, In the Matter of the Potomac Electric Company's Notice to Construct a 230kV/138 kV/13 kV Substation and Four 230 kV/138 kV Underground Transmission Circuits on Buzzard Point* ("*Formal Case No. 1123*"), Order No. 17851, at ¶ 19, rel. April 9, 2015 ("Order No. 17851").

3 *See* Appendix A – Consumer Choice & Emerging Technologies.

4 *Formal Case No. 1130*, Order No. 17912, rel. June 12, 2015 ("Order No. 17912").

example, while California and New York are leading the national debate, each of these states would rank among the major economies of the world if they were independent nations. The ratepayers in Hawaii, a leading jurisdiction on the use of renewables, pay three times what District residents pay per kilowatt hour. The District also shares its electric distribution with its neighboring state to the north.

While something can be learned from the efforts in all of these jurisdictions, Staff has found no grid modernization model that can be imported wholesale. To be successful, the reform path chosen by the Commission must fit the District's unique circumstances; these are just some of the differentiating factors that Staff believes are important for the Commission to consider as solutions are proposed.

In **Section III** of the Report, Staff identifies concurrent Commission proceedings, rulemakings, and related reports that may have an impact on the MEDSIS initiative and Staff recommendations. Staff provides a detailed discussion of each relevant item identified in Section III, in Appendix B to this Report. Staff recognizes that the MEDSIS dialog does not exist in a vacuum and that the Commission must balance the interests of shareholders and ratepayers in its conduct of contested base rate cases, even while new business models and alternative rate structures are debated in this proceeding.

Section IV of the MEDSIS Report provides an overview of the series of three public workshops that were held by the Commission between October of 2015 and April of 2016. At the workshops, presentations were made by interested persons on a host of topics ranging from modernization experiences in other jurisdictions to public-sited microgrids and distributed generation.[5] In Section IV, Staff also synthesizes the comments filed in the MEDSIS docket in response to Commission Order No. 18144. In that Order, the Commission requested public comment on six issues focused on the legal and regulatory framework needed in the District to support a modern energy system that includes distributed resources.

Among the issues the Commission requested comments on were: How can the Commission support and facilitate the review and approval of distributed generation facilities that are in the public interest? Are the Commission's current regulations adequate and appropriate to regulate the construction, operation, and maintenance of distributed generation facilities such as microgrid facilities? Are the current regulations a barrier to the development of distributed generation facilities? And, what statutory provisions or regulations adopted or proposed in other jurisdictions should the Commission consider in the District?[6]

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[5] There has been substantial activity in the MEDSIS docket as well. Over 35 substantive comments have been filed by interested persons, providing thoughtful input on how the initiative should be focused as well as on what types of technologies would be best suited for the District. *See* Appendix D – Workshop Participation Details. Table 10 – List of Formal Case No. 1130 Workshop Presenters and Table 11 – List of Comments Filed in Formal Case No. 1130.

[6] *See Formal Case No. 1130*, Order No. 18144, ¶ 6, rel. March 17, 2016 ("Order No. 18144").

Section V of the Report contains the legal and regulatory aspects of MEDSIS. More specifically, Staff responds to the comments filed in response to Commission Order No. 18144. Staff identifies the legal barriers to distributed energy resource penetration and energy efficiency advancement and discusses the Commission's current jurisdiction over a host of distributed energy resources ("DER") including, but not limited to, generating facilities, renewable generation, and energy storage.

The legal section also proposes regulatory changes that Staff believes are needed to further the goals of MEDSIS, including the recommended adoption of new definitions within the Commission's regulations, amending the existing definitions of "Electrical Company" and "Electricity Supplier," and streamlining the Commission's NOC rules for renewable generating facilities.[7] Staff has drafted the proposed definitions in the form of Draft Notice of Proposed Rulemakings ("NOPRs") and attached them to this Report at Appendices E and F for public comment.[8]

In addition to the regulatory changes recommended in the legal section of this Report, in Section V subsection C, Staff discusses the emergence of public-sited microgrids in District, including the potential benefits of such microgrids as well as the foreseeable problems that untested microgrid business models may present in light of our current regulatory framework.[9]

Section VI discusses the economic aspects of MEDSIS. Staff acknowledges critical economic issues brought forward in MEDSIS and points out that, because they implicate open base rate case proceedings, analysis in this Report must be limited. Once those formal cases are resolved, discussion of these issues should resume, either within the MEDSIS framework or some other Commission proceeding.

It is clear from the presentations given at the workshops and comments received in this proceeding that interested persons envision the implementation of a robust pilot and demonstration program that can yield tangible and long-lasting benefits for District ratepayers. Staff agrees that one of the goals of MEDSIS Initiative should be the realization of such projects. Therefore, in **Section VII** of this Report, Staff proposes detailed preliminary parameters addressing how the funding from the MEDSIS Subaccount Fund, established in the Pepco-Exelon Merger, can be used to implement District-appropriate pilot and demonstration projects. Staff also proposes that an independent board of stakeholders be created to review pilot projects submitted for MEDSIS grant funding using the parameters adopted by the Commission after considering public comment. Additionally, Staff recommends holding a MEDSIS Town Hall to garner public comment on Section VII before initial comments on the Staff Report are due.

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[7] *See* Section V.B.3 – Legal & Regulatory Aspects of MEDSIS – Distributed Energy Resources – Recommended Action.

[8] See Appendices E and F, Draft NOPR.

[9] *See* Section V.C – Legal & Regulatory Aspects of MEDSIS – Microgrids in the District.

The MEDSIS Report concludes in **Section VIII**, wherein Staff proposes the Commission's next steps in the MEDSIS Initiative, which are discussed in greater detail below. Staff also provides a proposed implementation timetable that reflects all of the recommendations made throughout the Report so that stakeholders and the public at large are aware of, and can comment on, all recommended actions.

STAFF RECOMMENDS SIGNIFICANT ACTIONS BE TAKEN NOW

As discussed by section above, the MEDSIS Report provides Staff's proposed recommendations to move the MEDSIS initiative forward, using a combination of short-term measures and long-term action. Below, Staff highlights the most pertinent recommended actions and Report contents.

(1) Proposed Regulatory Changes

Throughout the MEDSIS Report, in both the legal and regulatory section as well as the economic section, Staff has proposed a host of recommended actions for the Commission's consideration. Here, Staff provides a complete list of all recommendations proposed in this Report in a quick reference style table with the corresponding page(s) within the Report where the recommendation is discussed. The recommendations presented in this chart also align with the Implementation Timetable (See Table 8) as well as the definitions presented in the Draft NOPR at Appendices E and F.

TABLE 1: RECOMMENDED ACTIONS QUICK REFERENCE CHART

Recommended Actions Quick Reference Chart		
Item	**Recommended Action**	**Reference Pages**
1.	Draft Notice of Proposed Rulemakings to Address Various Types of Distributed Energy Resources	31-45
2.	Issue a Notice of Proposed Rulemaking to Adopt Definition of Distributed Energy Resource	32
2.a	Issue a Notice of Proposed Rulemaking to Adopt Definition of Distributed Generation	33
2.b	Issue a Notice of Proposed Rulemaking to Adopt Definition of Fossil Fuel Generator	35
2.c	Issue a Notice of Proposed Rulemaking to Adopt Definition of Cogeneration Systems	35
2.d	Issue Notice of Proposed Rulemaking to Adopt Definition of Fuel Cells	36-37
2.e	Issue Notice of Proposed Rulemaking to Adopt Definition of Microturbines	36-37
2.f	Issue a Notice of Proposed Rulemaking to Adopt Definition of Net Energy Metering Facilities	37-38
2.g	Issue Notice of Proposed Rulemaking to Adopt Definition of Back-up Generators	38
2.h	Issue a Notice of Proposed Rulemaking to adopt Definition for Energy	39

Recommended Actions Quick Reference Chart		
Item	**Recommended Action**	**Reference Pages**
	Storage	
2.h	Issue Notice of Proposed Rulemaking to Adopt Definition of Batteries	39-40
2.j	Issue Notice of Proposed Rulemaking to Adopt Definition of Electric Vehicles found in DC Code § 50-1501 (12)	40
2.k	Issue Notice of Proposed Rulemaking to Adopt Definition of Fly-wheels	40
2.l	Issue Notice of Proposed Rulemaking to Adopt Definition of Demand Response	40-42
2.m	Issue Notice of Proposed Rulemaking to Adopt Definition of Microgrids	44
3.	Issue a Notice of Proposed Rulemaking to Streamline Notice of Construction (NOC) Rules for Renewable Generation Construction Facility Approvals to within 20 Days	60-61
4.	Issue a Notice of Proposed Rulemaking to adopt a definition of Electrical Company that clarifies that the term expressly excludes any person or entity distributing electricity from a behind-the-meter generator to a retail customer behind the same meter.	63-65
5.	Issue a Notice of Proposed Rulemaking to Amend the Definition for Electricity Supplier	69-70
6.	Initiate Pilot Programs Funding Process Pursuant to § VII of this Staff Report	90-98

(2) Proposed MEDSIS Pilot Project Grant Funding Parameters

A detailed Staff proposal setting out parameters that can be used to evaluate proposed pilot projects that will be submitted to the Commission to obtain partial or full funding from the MEDSIS Subaccount Fund (which was established pursuant to Order No. 18160,[10] that approved the Pepco-Exelon Merger) is set out in Section VII of this Report and captured in Table 6.

Staff also proposes a five phase process and timeline to implement the MEDSIS Pilot Project program in Table 7, including how Requests for Qualifications will be submitted, how projects will be selected, and what aspects of projects are eligible for funding from the MEDSIS Subaccount. Staff also proposes on-going monitoring, reporting, and evaluation requirements for all MEDSIS Pilot Projects as well as an annual accounting and full reconciliation of the MEDSIS Fund Subaccount. Staff also recommends that all eligible project submissions be reviewed by an

[10] *Formal Case No. 1119, In the Matter of the Joint Application of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC and New Special Purpose Entity, LLC for Authorization and Approval of Proposed Merger Transaction* (“*Formal Case No. 1119*”), Order No. 18148, rel. March 23, 2016 (“Order No. 18148”).

advisory board that makes a recommendation to the Commission for which projects should be selected, with the Commission making the ultimate selections. Lastly, Staff recommends that a MEDSIS Town Hall be held by the Commission to garner public comment specifically on this section of the Report before initial comments are due.

(3) Implementation Timetable

Staff provides a detailed implementation timetable that outlines expected deliverables as well as proposes continued public engagement and additional progress tracking tools, like an "Annual MEDSIS Status Report" to account for the progress of the MEDSIS Initiative, including, but not limited to: (1) outlining lessons learned, status of proposed rulemakings and legislative changes, and other proposed actions to move the MEDSIS Initiative forward; (2) detailing work completed, goals reached, and projects approved in the prior year as well as planned or approved for the coming year(s); and (3) providing an accounting of the MEDSIS Pilot Project Fund, including fund balances, disbursements made in the year, and planned disbursements for the coming year(s) (See Table 8).

Staff also provides recommended deadlines for actually issuing the NOPRs included as drafts at Appendices E and F of this Report.

Staff also proposes that the Commission hold a MEDSIS Town Hall to garner public comment specifically on Section VII ("Proposed MEDSIS Grant Funding Parameters and Demonstration Projects") of the MEDSIS Staff Report. Staff recommends that the Town Hall be narrowly tailored to getting public input on the proposed governance structure, pilot project parameters, funding mechanisms, project selection criteria, and timelines for selecting projects. Staff recommends that the MEDSIS Town Hall be held within 40 days of issuance of this Report – well before the initial comments on the entirety of the MEDSIS Staff Report are due.

NEXT STEPS FOR MEDSIS

Staff recommends that before any final decisions on the recommendations provided in this Report are made by the Commission, this MEDSIS Report be released for public comment with extended comment and reply comment periods to facilitate public involvement. Staff hopes to receive robust public comment on all aspects of this Report including, but in no way limited to whether:

- Staff has appropriately set out the scope of the Commission's jurisdiction;
- The definitions presented in the Draft Notice of Proposed Rulemakings ("NOPRs") at Appendices E and F are adequate and appropriate;
- Staff's discussion of microgrids in the District in relation to the Commission's jurisdiction and other statutory and regulatory requirements is correct;
- The proposed pilot project grant funding parameters are appropriate;
- The proposed implementation timetable is appropriate, and
- Additional information needs to be provided in the Annual MEDSIS Status Report, besides what is proposed in Table 8.

Furthermore, while Staff recommends that the Commission hold a MEDSIS Town Hall to engage the public on Section VII of the Report before initial comments are due, Staff invites comment on other appropriate ways to engage the public in the MEDSIS Initiative besides considering all comments filed in the Formal Case No. 1130 docket.

Staff recognizes that this MEDSIS Staff Report is only the first step in what will be a long process to modernize the District's energy system. There are also significant issues related to system planning, regulatory models, and rate design that have yet to be addressed, as noted in the Economics Section. This includes the environmental benefits and cost-effectiveness of potential technologies and policies that aim to modernize the energy delivery system and advance energy efficiency in the District. Staff cannot publically comment on these matters until after the Commission has reached final decisions in the two open base rate case proceedings (Formal Case Nos. 1137 and 1139) where they are designated issues. However, Staff envisions that once those proceedings have concluded, a new round of public and stakeholder engagement will be initiated to address these issues and incorporate updated Staff recommendations into the plans for MEDSIS going forward.

Staff recommends that comments on the entirety of the MEDSIS Staff Report be due 60 days after the date of the Report's issuance with reply comments due 30 days thereafter.

CONCLUSION

Staff believes that the MEDSIS Initiative must serve the needs of the District and its residents, first and foremost. Staff is mindful of public concern over the District's growing economic divide and the negative impact of rising costs for both living and housing. The District Government has advanced aggressive clean-energy goals and new residential and commercial development continues at a fast pace. How we reconcile these trends with our modernization efforts in ways that are both practical and effective will be an ever present consideration in the MEDSIS Initiative.

Finally, this Report could not have been completed without the many voices who contributed their thoughts and views. Rome was not built in a day nor will the District's energy delivery system be modernized overnight. Indeed, Staff believes this initiative will span many years and contain multiple phases. While turning utility regulation on a dime is not feasible, Staff fully agrees that standing still in the face of rapid technological change is not an option. It is Staff's hope that this Report represents a significant step forward in the Commission's journey toward modernizing the District's energy system by clarifying the Commission's role in several respects as well as providing a workable framework moving forward with the initiative.

Staff remains committed to working with all those interested in the MEDSIS Initiative in a collaborative manner to review and, where appropriate, refine the goals and objectives of MEDSIS. Finally, Staff remains dedicated to managing this initiative in a transparent manner that serves the public interest.

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I. INTRODUCTION

Grid modernization has been described as an effort to assure "continued safe, reliable, and resilient utility network operations, [which] enables [a jurisdiction] to meet its energy policy goals, including integration of variable renewable electricity sources and distributed energy resources."[11] It is recognized that "[a]n integrated, modern grid provides for greater system efficiency and greater utilization of grid assets, enables the development of new products and services, provides customers with necessary information and tools to enable their energy choices, and supports a standards-based and interoperable utility network."[12] Furthermore, expanded use of natural-gas-fired cogeneration ("CHP") may also trigger needed upgrades to the natural-gas distribution network in the District of Columbia. Such projects may be implemented with or without microgrid functionality and will need to be included in plans for future energy delivery systems. Commission Staff is concerned that the current regulatory framework in the District may impede such necessary grid modernization efforts if it is not revised to keep pace with rapid changes in consumer preferences and technology.[13]

As such, the major goal of this Staff Report is to both identify the barriers to modernization of the energy delivery system that existing rules and regulations in the District present and to then provide actionable solutions to removing these barriers in a manner that comports with the Commission's statutory duties and the District's goal of promoting a clean energy economy. Ultimately, the providers of distributed energy resources ("DER"), which includes distributed generation ("DG"),[14] should have fair access to the District's energy market because DER proliferation is both consistent with the District's energy policy, which calls for increased competition for clean energy resources, and consistent with industry trends.[15] Once the District's regulatory framework is updated to address these changes and to remove barriers to market

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[11] Minnesota Public Utilities Commission, Staff Report on Grid Modernization, at 1-2, rel. March 2016.

[12] Minnesota Public Utilities Commission, Staff Report on Grid Modernization, at 1-2, rel. March 2016.

[13] Staff provides a brief discussion on consumer preferences and emerging technologies in Appendix A.

[14] Staff notes the abbreviations for common industry terms like DER and DG in this Report. However, for clarity and ease of reference, Staff routinely spells out these terms throughout the Report.

[15] According to the U.S. Department of Energy, distributed generation (DG) is the term used when electricity is generated from sources, often renewable energy sources, near the point of use instead of centralized generation sources from power plants. U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, http://energy.gov/eere/slsc/renewable-energy-distributed-generation-policies-and-programs (accessed October 20, 2016). According to the "NARUC Manual on Distributed Energy Resources Rate Design and Compensation," Distributed Energy Resources (DERs) are resources "sited close to customers that can provide all or some of their immediate electric and power needs and can also be used by the system to either reduce demand (such as energy efficiency) or provide supply to satisfy the energy, capacity, or ancillary service needs of the distribution grid. The resources, if providing electricity or thermal energy, are small in scale, connected to the distribution system, and close to load. Examples of different types of DER include solar photovoltaic (PV), wind, combined heat and power (CHP), energy storage, demand response (DR), electric vehicles (EVs), microgrids, and energy efficiency (EE)." NARUC Manual on Distributed Energy Resources Rate Design and Compensation (November 2016) at 45.

access, Staff believes the market and consumer choice will determine which technologies are actually viable. Recognizing the above, the Public Service Commission of the District of Columbia ("Commission") opened Formal Case No. 1130 to modernize the District's energy delivery system for increased sustainability, reliability, efficiency, and cost effectiveness.[16]

The Commission held three technical workshops and received thoughtful input from a range of stakeholders outlining future energy delivery plans and visions along with suggestions for Commission action to help implement their visions. Based on these preliminary interactions and the comments filed in the Formal Case No.1130 docket, the Commission directed its Staff to synthesize these inputs to develop a Staff Report that provides a framework for considering the next steps to be taken by the Commission. In setting the framework, the Commission directed the Staff to be mindful of the District's existing legal and regulatory structure for energy delivery; the District's goals for future energy development; as well as the unique characteristics of the District that set it apart from other jurisdictions. In addition, the Commission directed the Staff to prepare a report that was consistent with the Commission's mission to serve the public interest by ensuring that financially healthy electric, natural gas, and local telecommunications companies provide safe, reliable, and quality utility services at just and reasonable rates for District of Columbia residential, business, and government ratepayers. Finally, the Commission directed the Staff to highlight what changes or clarifications, if any, would need to be made to the District's existing legal and regulatory framework and to the Commission's existing rules to implement the MEDSIS goals and objectives that have been identified so far.

A. Purpose & Overview

The purpose of this Staff Report is multifold. Staff recognizes that the needs, uses, and expectations of the District of Columbia's energy delivery system are evolving and energy technologies and the District's energy policy goals are developing as well. The Commission needs to be prepared to accommodate and implement plans, consistent with the Commissions overall mission and the public interest, that move the District towards a modern, reliable, resilient, and cost-considerate grid, while simultaneously promoting competition and maintaining the financial health of the District's utilities. Therefore, this Staff Report will:

(1) Discuss the Commission's jurisdiction and the existing system for energy delivery in the District's restructured market;
(2) Summarize the current status of the MEDSIS initiative, including brief discussions, where pertinent, of presentations, comments, and recommendations filed in the MEDSIS docket;
(3) Identify the legal, regulatory, operational or structural challenges as well as recommended changes required to implement projects that further the goal of the MEDSIS Initiative;
(4) Discuss economic topics raised by MEDSIS participants;
(5) Discuss and delineate specific criteria for the use of MEDSIS funds to support demonstration and pilot projects in the District; and

16 *Formal Case No. 1130*, Order No. 17912, at ¶ 5.

(7) Present a proposed Implementation Plan which includes proposals on how stakeholders and the general public can participate in the MEDSIS Initiative going forward.

B. The Commission's Jurisdiction & the District of Columbia's Restructured Energy Market

Staff goes into greater detail regarding the Commission's jurisdiction as it pertains to specific topics throughout this Report; however, as an initial matter, Staff believes it is important to discuss the Commission's overarching jurisdiction in the District's energy market as well as how the energy market has been restructured.

1. Jurisdiction of the Commission

The Commission was formed in 1913 by act of Congress in order to regulate the utilities in the District of Columbia; D.C. Code § 1-204.93 (Public Service Commission) states:

> There shall be a Public Service Commission whose function shall be to insure that every **public utility** doing business within the District of Columbia is required to furnish service and facilities reasonably safe and adequate and in all respects just and reasonable. The charge made by any such public utility for any facility or services furnished, or rendered, or to be furnished or rendered, **shall be reasonable, just, and nondiscriminatory**. Every unjust or unreasonable or discriminating charge for such facility or service is prohibited and is hereby declared unlawful.

A **public utility** refers to "every street railroad, street railroad corporation, common carrier, *gas plant*, *gas company*, *electric company*, telephone corporation, telephone line, telegraph corporation, telegraph line, and *pipeline company*."[17] The term excludes electric generating facilities and "a person or entity that owns or operates electric vehicle supply equipment but does not sell or distribute electricity, an electric vehicle charging station service company, or an electric vehicle charging station service"[18] It should be noted that the term pipeline company would encompass any heating or cooling system that supplies customers, such as those associated with the use of steam plants or cogeneration.[19]

The Commission's jurisdiction is set forth in D.C. Code § 34-301 (Public Service Commission; general powers) which states that the Commission shall, within its jurisdiction:

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17 D.C. Code § 34-214 (emphasis added).

18 D.C. Code § 34-207.

19 D.C. Code § 34-213. The term "pipeline company" when used in this subtitle includes every corporation, company, association, joint-stock company or association, partnership, or person, their lessees, trustees, or receivers, appointed by any court whatsoever, owning, operating, managing, or controlling the supply of any liquid, steam, or air through pipes or tubing to consumers for use or for lighting, heating, or cooling purposes, or for power.

> Have general supervision of all gas companies and electrical companies having authority under any general or special law or under any charter or franchise to lay down, erect, or maintain wires, pipes, conduits, ducts, or other fixtures in, over, or under the streets, highways, and public places, in the District of Columbia for the purpose of furnishing or distributing gas or of furnishing or transmitting electricity for light, heat, or power, or maintaining underground conduits or ducts for electrical conductors, and all gas plants and electric plants owned, lease or operated by any person…
>
> …examine or investigate the methods employed by such persons and corporations in manufacturing, distributing, and supplying gas and in transmitting or distributing electricity for light, heat, or power, and in transmitting the same, and have such power to order such with respect to manufacturing, distributing, or supplying such gas, or with respect to transmitting or distributing such electricity as will **reasonably promote the public interest, preserve the public health, and protect those using such gas or electricity** and those employed in the manufacture and distribution of gas or the transmission or distribution of electricity . . .

These provisions combined make it clear that the Commission's primary function is to regulate utilities to ensure that they provide just, reasonable, and nondiscriminatory rates as well as to ensure public safety and reliability of service by setting safety, efficiency, operation standards and supervising the operations of electric and gas companies. The Commission also has the primary function of protecting residential consumers. As such, the Commission has developed a Consumer Bill of Rights ("CBOR") which sets "forth residential consumer rights, responsibilities and rules for the initiation and acquisition of services, such as, but not limited to Meter reading, Billing, Deposits, Disconnections and Reconnections of service and the resolution of Complaints between residential consumers and a Utility, Energy Supplier or Telecommunications Service Provider."[20]

An **electrical company** "includes every corporation, company, association, joint-stock company or association, partnership, or person doing business in the District of Columbia, their leases, trustees, or receivers, appointed by any court whatsoever, *physically transmitting or distributing electricity in the District of Columbia to retail electric customers*."[21] "The term excludes any building owner, lessee, or manager who, respectively, owns leases, or manages, the internal distribution system serving the building and who supplies electricity and other related electricity services solely to occupants of the building for use by the occupants."[22]

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20 15 DCMR § 300 *et seq*.

21 D.C. Code § 34-207 (emphasis added).

22 D.C. Code § 34-207.

A **gas company** includes "every corporation, company, association, joint-stock company or association, partnership, or person *manufacturing, making, distributing or selling gas for light, heat, or power, or for any public use whatsoever in the District of Columbia*, their lessees, trustees, or receivers, appointed by any court whatsoever, and in said district *selling, physically transmitting, or distributing natural gas in the District of Columbia to retail natural gas customers*."[23] "The term excludes any building owner, lessee, or manager who respectively, owns leases, or manages, the internal distribution system serving the building and who supplies natural gas and other related natural gas services solely to occupants of the building for use by the occupants."[24]

The Commission's jurisdiction also extends to electric plants and gas plants. An "electric plant" is defined as "the material equipment and property owned and used, or to be used, by the electric company for or in connection with the transmission or distribution of electricity in the District of Columbia to a retail electric customer."[25] A "gas plant" means the material equipment and property owned and used, or to be used, by the gas company for or in connection with the transmission or distribution of natural gas in the District of Columbia to a retail natural gas customer.[26]

2. The District's Restructured Energy Market

Prior to the passage of the Retail Electric Competition and Consumer Protection Act of 1999 ("1999 Act"), the electricity market in the District of Columbia was vertically integrated and the Potomac Electric Power Company ("Pepco") provided generation, transmission, and distribution of electricity as a bundled product to all customers in the District.[27] In accordance with the regulatory compact between the District and Pepco, the Company was granted a *de facto* monopoly over the components of electric service in exchange for submission to rate regulation.[28] However, Federal Energy Regulatory Commission ("FERC") Order No. 888 issued in 1996, which required electric companies to allow third parties to use the company's transmission lines "on the same terms and conditions that the electric company uses those lines," facilitated the abolishment of regulatory compacts with respect to generation, and the opening of retail electricity supply markets to competition. Pepco divested itself of its generation assets and

23 D.C. Code § 34-209 (emphasis added).

24 D.C. Code § 34-209.

25 D.C. Code § 34-206.

26 D.C. Code § 34-210.

27 Retail Electric Competition and Consumer Protection Act of 1999, D.C. Law 13-107 (May 8, 2000).

28 D.C. Council, Report on Bill 13-284, the "Retail Electric Competition and Consumer Protection Act of 1999," (December 2, 1999), enacted as DC Law 13-107, at 2-3.

became a distribution-only company, and the electricity market in the District was opened to competing electricity suppliers for the provision of generation and transmission services.[29]

The Act's essential function is to enable "customer choice" or "choice of electricity suppliers," which is defined as "the right of electricity suppliers and consumers to use and interconnect with the electric distribution system on a nondiscriminatory basis in order to distribute electricity from any electric supplier to any customer. Under this right, consumers shall have the opportunity to purchase electricity supply from their choice of licensed electricity suppliers."[30] The Act secondarily enabled "Competitive billing" which is defined as "the right of a customer to receive a single bill from the electric company, a single bill from the electricity supplier, or separate bills from the electric company and the electricity supplier."[31]

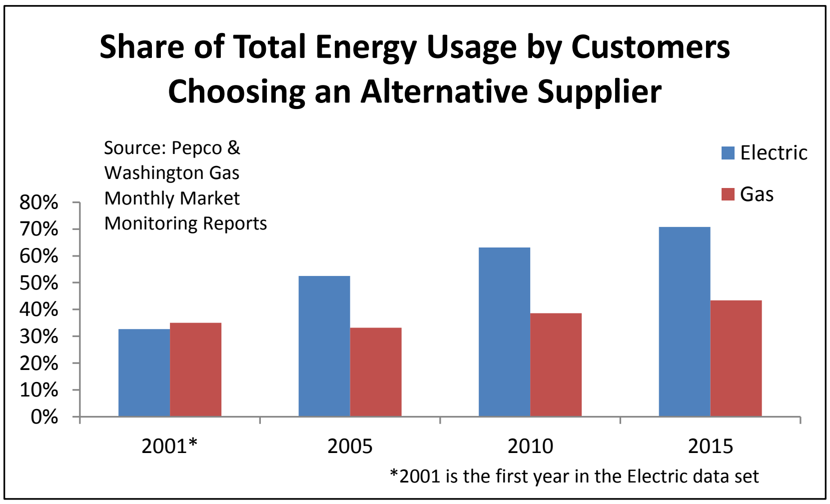

FIGURE 1: ENERGY USAGE BY AES CUSTOMERS

Under this new regulatory construct, customers in the District can obtain electricity from some combination of three distinct sources: (1) Standard Offer Service ("SOS"); (2) an Electric Supplier; or (3) a Customer-generator, which will be discussed in more detail below. Pepco, the distribution company, was to be legally separated from the sale of generation in that "[o]ther than its provision of standard offer service, the electric company shall not engage in the business of an electricity supplier in the District of Columbia except through an affiliate."[32] Further, the Act curtailed Generating Facilities located in the District. During the Act's passage, Pepco began to look at divesting itself of its generation plants, including its Benning Road and Buzzard Point

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29 Pepco filed an Application to divest its generation assets and purchase power agreements with the Commission on March 16, 1999. On July 2, 1999, at the request of the Council, the Commission held in abeyance our consideration of Pepco's Application pending Council action. *See Formal Case No. 945*, *In the Matter of the Investigation into Electric Service Market Competition and Regulatory Practices*, Order No. 11576, rel. December 30, 1999 ("Order No. 11576").

30 D.C. Code § 34-1501 (14) (2001).

31 D.C. Code § 34-1501 (8) (2001).

32 D.C. Code § 34-1513 (a) (2001).

Generating Facilities in the District. The Act established a means for Pepco to sell to a third-party or transition these facilities to an affiliate, as well as a means of examining their decommissioning.[33] Further, the Act mandated that any new generation constructed in the District for the sale of electricity must be found by the Commission after notice and hearing to be in the public interest.[34]

Importantly, the Act constrains the Commission by specifically mandating that "the supply and sale of electricity shall not be regulated except as expressly set forth" in the Act.[35] While constraining the Commission on the regulation of the supply and sale of electricity, the Act empowers the Commission to further restrict Pepco's monopoly over the distribution and metering of electricity (the two remaining sections of electricity delivery) by declaring components as potentially competitive.[36] To declare a component of electricity a competitive service the Commission needs to find:

A) Provision of the service by alternative sellers will not harm any class of customers;
B) Provision of the service will decrease the cost of providing the service to customers in the District of Columbia or increase the quality or innovation of the electric service to customers in the District of Columbia;
C) Effective competition in the market for that service is likely to develop; and
D) Provision of the service by alternative sellers will not otherwise jeopardize the safety and reliability of electric service in the District of Columbia.[37]

The Act protects Pepco by ensuring that the Commission provide for the recovery of "all verifiable costs . . . which will not be recoverable" under its declaration of a competitive service.[38]

With respect to the District's natural gas utility, the Washington Gas Light Company ("WGL"), the Commission began deregulation of the retail natural gas market through the approval of tariffs in January of 1998.[39] However, legislatively the "Retail Natural Gas Supplier Licensing and Consumer Protection Act of 2004" ("2004 Act"), was enacted with a purpose of codifying open competitive access to the retail natural gas distribution system by suppliers and providing vital consumer protections in a similar manner as the 1999 Act had for the electricity market. In the legislative history of the 2004 Act Council stated: "Similar to electric, the bill also makes a

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33 D.C. Code § 34-1519 (2001).

34 D.C. Code § 34-1516 (2001).

35 D.C. Code § 34-1502 (a) (2001).

36 D.C. Code § 34-1504 (e) (2001).

37 D.C. Code § 34-1504 (e)(1) (2001).

38 D.C. Code § 34-1504 (e)(2) (2001).

39 *GT96-2, In the Matter of Washington Gas Light Company District of Columbia Division for Authority to Establish Rate Schedule 2-A and Rate Schedule 5*, Order No. 11132, rel. January 20, 1998 ("Order No. 11132").

number of amendments to existing utility laws, the effect of which is to treat the competitive natural gas market in a similar manner to the competitive electricity market. The Subcommittee has strived to mirror much of D.C. Law 13-107, the "*Retail Electric Competition and Consumer Protection Act of 1999*."[40] Therefore, the natural gas company was charged with "provid[ing] distribution services to customers and natural gas suppliers on rates, terms of access, and conditions that are comparable to the gas company's own use of its distribution system."[41] It is worth noting that while much has changed in the electricity market, especially as it pertains to distributed generation ("DG"), the same is not true with regard to the natural gas market, which has remained relatively consistent with the changes envisioned by the 2004 Act. However, there have been advances in the way natural gas is being used to power distributed generation facilities, such as combined heat and power facilities ("CHP").

It is clear from the legislative history of the 1999 and 2004 Acts that the Council envisioned that the restructuring and introduction of competition would lead to energy suppliers competing with the utility default service to bring energy from the wholesale market across the distribution grid to customers at lower prices. The Acts also envisioned that the electricity and natural gas markets would not only result in competition and costs savings for customers, but also in "increased efficiencies in the provision of [energy] service to District of Columbia consumers."[42] It has become clear that the energy markets, the electricity market in particular, in the District have evolved beyond what the language of the Acts can accommodate in that the increased availability of DER and DG in particular is enabling customers to generate their own electricity and decrease their reliance on both the wholesale market and the distribution system. Therefore, the statutory and regulatory structure put in place to carry out the Council's directions are in need of reassessment to both meet market demands and facilitate the District's energy goals.

The Commission believes that the MEDSIS initiative and the proposals stemming from this Staff Report are directly in-line with the District's stated goal of increasing efficiencies in the provision of energy service in the District, because the MEDSIS initiative focuses on modernizing the energy delivery system in a manner that will allow for the entry of clean and efficient distributed energy resources ("DER"). Additionally, Staff believes that the analysis provided regarding the changes needed to further enable customer choice and the interconnection of new technologies advances the Council's vision of the District's energy market.

[40] D.C. Council, Report on Bill 15-0679, the "Retail Natural Gas Supplier Licensing and Consumer Protection Act of 2004," (November 1, 2004), enacted as DC Law 15-227, at 11-12 ("2004 Act").

[41] D.C. Code § 34 1671.06 - Duties of the gas company.

[42] 2004 Act, at 6.

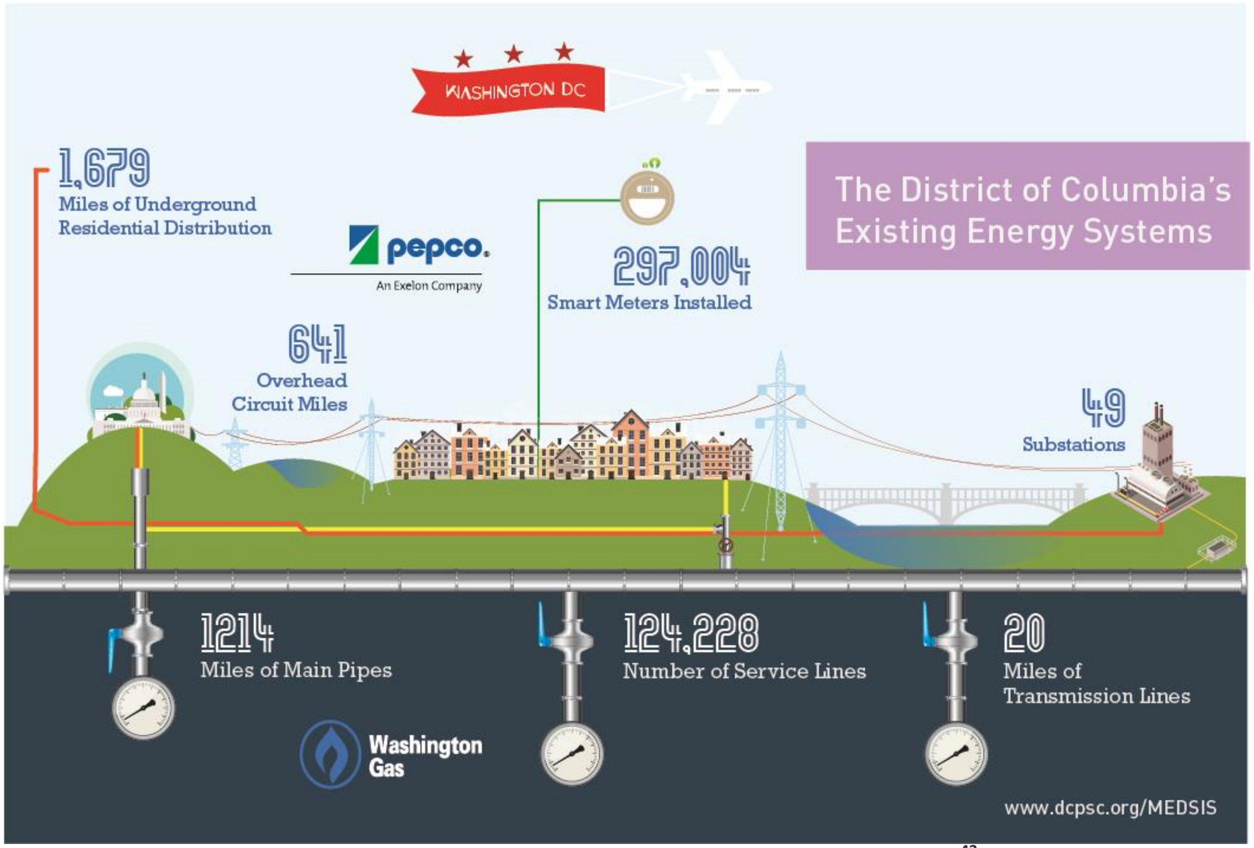

FIGURE 2: THE DISTRICT OF COLUMBIA'S EXISTING ENERGY SYSTEMS[43]

C. The District's Critical Infrastructure

Power systems are becoming increasingly integrated with other key sectors and critical infrastructure. As discussed in a recent MIT Energy Initiative "Utility of the Future" report, the "trend is the increasing interconnectedness and interdependence of electricity and other key sectors and critical infrastructure, such as communications, natural gas, heat, and transportation. Very few industries would function without the steady supply of electricity, making reliable, secure, and affordable electric power systems a cornerstone of modern economies. As the US Department of Homeland Security notes, the energy sector – and electricity in particular – is 'uniquely critical because it provides an enabling function across all other critical infrastructure.'"[44]

The Department of Homeland Security has also stated that, "critical infrastructure provides the essential services that underpin American society and serve as the backbone of our nation's economy, security, and health. We know it as the power that we use in our homes, the water we

43 **Info graphic sources:** Informal Data Response from Pepco (December 7, 2016); Annual Report for Calendar Year 2015 Gas Distribution System US DOT/Pipeline and Hazardous Materials Safety Administration.

44 "Utility of the Future: An MIT Energy Initiative Response to an Industry in Transition," MIT Energy Initiative, at 7, rel. 2016.

drink, the transportation that moves us, the stores we shop in, and the communication systems we rely on to stay in touch with friends and family."[45] In total, there are 16 critical infrastructure sectors which include energy, government facilities, transportation, and emergency services.[46]

Every day, a majority of the District's work force commutes from nearby suburbs. The Washington area has the second highest percentage of public transportation users who rely on heavy rail after New York; Metrorail is powered by electricity.[47]

The District is home to major military installations, including the headquarters of the United States Coast Guard, Joint Base Bolling, Fort McNair, and the Washington Navy Yard. The energy delivery system in the District also serves the White House, the U.S. Capitol, and the Supreme Court as well as headquarters of numerous executive branch agencies including the State Department, Treasury, and Department of Veterans Affairs.

The General Services Administration ("GSA") manages and/or leases 100 million square feet of federal workspace, including 43 million square feet owned in the Washington metropolitan area. According to GSA, the federal government's total gas usage exceeds 17% of the District's total gas usage and federal government's electricity usage exceeds 26% of the District's total electricity usage.[48] GSA is Pepco's largest single user of electricity.

The District's energy delivery system also supports major hospitals, including Howard University Hospital, Georgetown University Hospital, George Washington University Hospital, Children's National Medical Center, and Medstar Washington Hospital Center.

Not only do the District's energy delivery systems provide service to critical infrastructure assets, those delivery systems are themselves critical infrastructure. Staff believes that the safety, reliability, and resiliency of the District's energy distribution systems must be considered as we develop ways to modernize these systems, including the impact of interconnecting more energy technologies and communications systems with the electric distribution system.

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[45] *What is Critical Infrastructure*, Department of Homeland Security, accessed November 8, 2016. https://www.dhs.gov/what-critical-infrastructure. *See also*, The National Infrastructure Protection Plan ("NIPP") 2013developed by the Department of Homeland Security. https://www.dhs.gov/sites/default/files/publications/NIPP%202013_Partnering%20for%20Critical%20Infrastructure%20Security%20and%20Resilience_508_0.pdf. *And see*, Presidential Policy Directive /PPD 21– Critical Infrastructure Security and Resilience, signed February 12, 2013. https://www.whitehouse.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil

[46] *What is Critical Infrastructure*, Department of Homeland Security, accessed November 8, 2016. https://www.dhs.gov/what-critical-infrastructure.

[47] Statistical Abstract of the United States: 2012 (131st Edition); Section 23: Transportation.

[48] *Formal Case No. 1130*, Stephen P. Sakach, Assistant Commissioner, Public Building Services, GSA Office of Facilities Management and Services Program, filed October 1, 2015.

D. Role of Commission Staff

This MEDSIS Staff Report represents the views of Commission Staff with respect to comments and issues that have been raised during the MEDSIS proceeding, in docketed comments as well as during the workshops. The Staff Report has two constraints that should be noted at the outset. First, some of the participants in Formal Case No. 1130 have raised legal issues as well as issues related to rates and tariffs for distribution service and the capital expenditures of the regulated utilities. Some of these matters will be addressed in this Staff Report; however, it must be noted that Staff's recommendations will not address issues that are presently being litigated in Formal Case Nos. 1137 and 1139 or any other open proceeding before the Commission.[49] The greater part of the topics related to economic regulation raised by MEDSIS participants fall under this exclusion. Consequently, this Staff Report contains limited analysis of or conclusions about matters in pending proceedings in order to not prejudge those issues before a decision is made by the Commission because Staff is not an independent party in the District of Columbia.

There exists a further constraint on Staff's analysis. In other jurisdictions where there are multiple electric utilities, it is possible for the staff of a regulatory commission to formulate abstract models, analyses, and principles regarding energy-system modernization without *necessarily* implicating any particular utility or any utility's open proceedings. However, it is simply not possible for the authors of this Staff Report to adopt that detached mode of analysis. In the District of Columbia, because, as noted in Section II, *infra*, there is only *one* electric distribution company and *one* natural gas company, any attempt by Staff to formulate a "vision of the electric grid" or "natural gas grid" is, necessarily, a statement about Pepco or Washington Gas.

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[49] *Formal Case No. 1137, In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges for Gas Service* ("*Formal Case No. 1137*"); *Formal Case No. 1139, In the Matter of the Application of Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service* ("*Formal Case No. 1139*").

II. DISTRICT SPECIFIC CHARACTERISTICS & ENERGY DELIVERY MODERNIZATION EFFORTS IN OTHER JURISDICTIONS

A. Unique Characteristics of the District of Columbia's Energy Market

Staff acknowledges that several stakeholders have provided recommendations to the Commission based on lessons learned, outcomes, and strategies implemented in other jurisdictions – like New York and California. While Staff is also considering how successful changes implemented in other jurisdictions can be translated to the District, it is important to highlight the unique characteristics of the District of Columbia's energy market that set it apart from other jurisdictions. For example, in addition to the District being a restructured market with open competition, there are only three major utilities, one for each industry, and the District shares its utilities among other jurisdictions, Maryland and Virginia, unlike New York and California. Additionally, the electric utility in the District (Pepco) is a member of PJM - a multi-jurisdictional RTO/ISO, and not a single-state RTO/ISO like New York or California – thus our ability to promote unilateral reform impacting the transmission system is more limited.[50]

Notably, as the nation's capital, the District has a heightened responsibility to protect critical infrastructure, ensure the reliable provision of energy to federal facilities, and maintain safety. Further, a large portion of the District's electric and gas energy load is consumed by the federal government – approximately 20%.[51] As a relatively small urban area, made up of largely commercial and residential load, with little industrial load, the energy distribution systems are generally more expensive to construct and maintain here than in suburban areas. Therefore, the benefit to District ratepayers of avoiding new distribution capacity by employing other resources may be higher than in other jurisdictions.

Pepco DC also has the highest AMI penetration in the country, with nearly 100% of Pepco's meters being AMI, which presents unique opportunities for data gathering and DER interconnection. Additionally, District policy has been at the forefront of promoting renewable energy through the District's Renewable Portfolio Standard, implementation of Community Renewable Energy Facilities ("CREF"), and Net Energy Metering ("NEM").

It is with this understanding of the District's current energy market and all of these District-specific characteristics in mind that the Commission must consider how to best modernize the energy delivery

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50 RTO means regional transmission operator. ISO means independent system operator.

51 *Formal Case No. 1130*, U.S. General Services Administration First Kickoff Workshop PowerPoint Presentation, at 3, filed October 1, 2015 ("GSA Initial Presentation").

systems in the District in a manner that will increase efficiency, maintain the health of the Utilities, improve reliability, and that is cost-effective.

B. Energy Delivery Modernization Efforts in Other Jurisdictions

Staff is cognizant that other state public service commissions are looking at similar issues related to the modernization of their energy systems and have reported that constructive and progressive changes that promote the development of a more modern energy delivery system are emerging from the use of a collaborative process. Furthermore, as noted above, numerous MEDSIS commenters urged the Commission to take note of modernization proceedings in other jurisdictions, including, but not limited to, California, Hawaii, Minnesota, Rhode Island, and New York. While it is routine to survey other regulatory jurisdictions regarding a specific regulatory policy or tariff, distribution system modernization is impacted by regulatory and statutory schemes that differ from state to state. This means that a productive analysis of how the modernization proceeding in, say, Hawaii relates to the experience of the District of Columbia would require an analyst to compare and contrast the entire legal and regulatory framework in the two states.

For example, District of Columbia Government ("District Government" or "DCG") claimed that "[t]he District of Columbia has the opportunity to learn from best practices and the shortcomings of similar projects by developing a targeted Demand Side Management (DSM) initiative in cooperation with the real-estate developers and interested energy service providers. This initiative should blend the best practices and lessons-learned from California's Distribution Resource Planning initiative and New York's Brooklyn-Queens Demand Management program (BQDM)."[52] No clarification was provided as to whether or how the examples cited could be implemented in the District under existing laws and regulations; nor were any "regulatory barriers" to these "best practices" cited, if they exist.[53]

As discussed in above, the District of Columbia's energy market has unique characteristics that must be considered when advocating the use of methods and best practices implemented in other jurisdictions. To see what this might entail, for example, consider that Minnesota and Hawaii are both vertically integrated jurisdictions while the District is deregulated (or "restructured"). California has characteristics of both and also has multi-year rate plans making the effort of drawing lessons from that state for the District exceedingly complex. Some jurisdictions, like the District, have high levels of advanced metering infrastructure ("AMI") deployment while others have not started yet. California and New York both have single-state independent system operators for their transmission and generation systems while the District operates within the strictures of the multi-state PJM Interconnection. In the District, all regulated distribution systems operate across state lines, as is the case with Pepco and WGL, while in other states utilities typically operate in one jurisdiction only. The District of Columbia is unique in having

[52] *Formal Case No. 1130*, District Columbia Government Supplementary Comment at 3, filed May 23, 2016 ("DCG Supp. Comments").

[53] One of the exceptions to this are the Comments of Pennoni (April 18, 2016) that attempted to tailor the lessons extracted from other jurisdictions to the specific circumstances of the District of Columbia.

no centralized power plants and is not covered by the U.S. EPA's Clean Power Plan. Therefore, effort required to extract "best practices" and "lessons learned" from other jurisdictions could be significant especially if the goal is to shape actual regulatory policy in the District of Columbia. Given the District's unique characteristics, Staff believes it is incumbent upon advocates of regulatory change to explain which modernization "best practices" are suitable for implementation in the District and which ones are not.

That being said, Staff has been and will continue to follow the energy delivery modernization efforts in the following jurisdictions in order to incorporate, where appropriate, best practices and lessons learned from their initiatives:

TABLE 2: ENERGY DELIVERY MODERNIZATION EFFORTS IN OTHER JURISDICTIONS

Energy Delivery Modernization Efforts in Other Jurisdictions	
(1)	New York – Reforming the Energy Vision (NY REV) (14-M-001);
(2)	Minnesota – e21 Initiative and Distribution Planning Investigation;
(3)	California – the Energy Storage Framework & Procurement (R1503011) and the Distribution Resources Plan (R140810);
(4)	Hawaii – the Investigation into Distributed Energy Resources Policies (2014-0192),
(5)	Illinois – the Microgrid Pilot Program in ComEd's Service Territory;
(6)	Vermont – the Green Mountain Power and Tesla Behind the Meter Storage Pilot;
(7)	Connecticut – the Demonstration Projects for Grid-Side System Enhancements to Integrate Distributed Energy Resources; and
(8)	Georgia – the Value of Distributed Energy Resources for Georgia Power 2016 Integrated Resource Plan (39732).
(9)	Maryland - Public Conference 44, In the Matter of Transforming Maryland's Electric Distribution Systems to Ensure that Electric Service is Customer-Centered, Affordable, Reliable, and Environmentally Sustainable in Maryland, Notice of Public Conference.
(10)	Rhode Island – Docket No. 4600 – Investigation into the Changing Electric Distribution System (3/3/16)

III. CONCURRENT COMMISSION PROCEEDINGS, RULEMAKINGS & RELATED REPORTS

In addition to the energy delivery modernization efforts underway in other jurisdictions, there are a host of open formal proceedings, pending or existing rulemakings, and industry reports underway in the District that may have an impact on the MEDSIS initiative. As such, Staff believes it is important to identify the matters that we are aware of that intersect with MEDSIS, especially those that may influence Staff recommendations.[54] Therefore, in Table 3 below, Staff provides a list of the known proceedings, rulemakings, related reports, and industry organizations that may have an impact on the MEDSIS initiative.

[54] For example, many stakeholders have commented on the need for improved interconnection procedures to facilitate the deployment of energy efficiency measures and DER in the District. Not only have Pepco's interconnection standards been a topic of concern in the Formal Case No. 1050 docket, but they were also raised in the Merger proceeding (*Formal Case No. 1119*). PHI has also released an initial and revised DER Interconnection Plan that details the Company's current and planned interconnection measures.

Staff provides a more detailed discussion of each of the above listed items, highlighting how they impact the MEDSIS initiative, in Appendix B of this Report. To the extent that these concurrent matters impact Staff's analysis and recommendations, Staff will also discuss them in other portions of the Report.

TABLE 3: CONCURRENT COMMISSION PROCEEDINGS, RULEMAKINGS, & RELATED REPORTS

Concurrent Commission Proceedings, Rulemakings, & Related Reports		
Commission Proceedings		
1.	Formal Case No. 874, In the Matter of the Gas Acquisition Strategies of the District of Columbia Natural Gas, A Division of the Washington Gas Light Company	
2.	Formal Case No. 1017, In the Matter of the Development and Designation of Standard Offer Service in the District of Columbia	
3.	Formal Case No. 1050, In the Matter of the Investigation of Implementation of Interconnection Standards in the District of Columbia	
4.	Formal Case No. 1086, In the Matter of the Investigation into the Potomac Electric Power Company's Residential Air Conditioner Direct Load Control Program	
5.	Formal Case No. 1098, In the Matter of the Petition for an Investigation into Retail Electricity Supplier Access to Smart Meter Data	
6.	Formal Case No. 1114, In the Matter of the Investigation of the Policy, Economic, Legal and Technical Issues and Questions Related to Establishing a Dynamic Pricing Plan in the District of Columbia	
7.	Formal Case No. 1116/1121, In the Matter of Applications for Approval of Triennial Underground Infrastructure Improvement Projects Plans & Pepco's Financing Order Application/ DC PLUG Initiative	
8.	Formal Case No. 1119, The Merger of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC and New Special Purpose Entity LLC	
9.	Formal Case No. 1137, In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges for Gas Service	
10.	Formal Case No. 1139, In the Matter of the Application of the Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service	
Commission Rulemakings		
1.	Energy Supplier Rules	Formal Case No. 945, RM46-2015-01
2.	Generating Facility Approval	D.C. Code § 34-1516
3.	Net Energy Metering & Community Net Metering	Formal Case No. 945, RM-9
Related Reports, Proceedings, Industry Organizations		
1.	PHI Interconnection of Distributed Energy Resources	June 21, 2016,
2.	PHI Distributed Energy Resources and the Distribution System Planning Process	September 23, 2016
3.	Maryland Public Conference 44	Public Comment due October 28, 2016

Concurrent Commission Proceedings, Rulemakings, & Related Reports		
4.	Maryland Resiliency Through Microgrids Task Force Report	June 23, 2014
5.	OPC's Value of Solar Study	Expected first Quarter 2017
6.	DOEE's Solar for All Study	Implementation Plan due to Council February 2017
7.	DOEE's Microgrid Study	Initiated in 2015 – Ongoing
8.	D.C. Sustainability Plan	Issued in 2012; Progress Report issued in April 2016
9.	Clean Energy DC	November 2016 Draft
10.	Argonne National Lab & Exelon's 5-year Research & Development Partnership	Initiated October 19, 2016
11.	Mid-Atlantic Distributed Resources Initiative (MADRI)	On-going
12.	The National Council on Electricity Policy	On-going
13.	The National Association of Regulatory Utility Commissioners	On-going

IV. THE MEDSIS INITIATIVE: A COLLABORATIVE EFFORT

A. Background

In Order No. 17851, the Commission stated that it would open a new docket to establish a working group to address in a more global way the future outlook for energy needs in the District of Columbia, the feasibility of deploying more energy storage facilities and increased distributed generation ("DG"), and the impact of these new technologies on Pepco's load forecasting and construction plan for the city.[55] On June 12, 2015, the Commission issued Order No. 17912 which opened this proceeding for the purposes of identifying technologies and policies that can be implemented to modernize energy delivery systems for increased sustainability ("MEDSIS") and make it more reliable, efficient, cost-effective and interactive.[56] The Order also established a series of workshops to be held; the first in October 2015, the second in November 2015, and the third on March 17, 2016.

In the first workshop, our two local energy utility companies, Pepco and WGL, the District of Columbia Department of Energy and the Environment ("DOEE"), the General Services Administration ("GSA") and the DC Sustainable Energy Utility ("DC SEU") provided an overview of the status of the current energy infrastructure in the District of Columbia and shared

55 *Formal Case No. 1123, In the Matter of the Potomac Electric Company's Notice to Construct a 230kV/138kV/13 kV Substation and Four 230 kV/138 kV Underground Transmission Circuits on Buzzard Point* ("*Formal Case No. 1123*"), Order No. 17851, rel. April 9, 2015.

56 *Formal Case No. 1130*, Order No. 17912, rel. June 12, 2015.

plans to modernize the system. In the second workshop, various developers of DER facilities shared information about their projects and about policy and legal barriers encountered while pursuing their initiatives.

The Commission found that the information presented in the first two workshops "underscore[s] the fact that the development community in the District and various government entities are exploring a number of new technologies and business models for potential economic development projects that will use both renewable and other fuel energy sources. These include projects that may incorporate DERs into new planned mixed use developments for residential and commercial ratepayers, into university facilities, into distribution system facilities, and into projects that support governmental facilities, among other things." The Commission also recognized that "[t]here is also a growing interest in the development and use of microgrids on university campuses and some public and private sites. Besides the projects discussed at the first two workshops, there are additional DER facilities that are currently authorized under the D.C. Code. These include customer-generators authorized under D.C. Code § 34-1518; community renewable energy facilities ("CREF") authorized under D.C. Code § 34-1518.01; electric vehicles and electric charging stations authorized under D.C. Code §§ 34-207 and 34-214; and various co-generation facilities like the new anaerobic digesters at D.C. Water's Blue Plains facilities and the combined heat and power facilities ("CHP") currently owned and operated by various government, university and commercial entities."[57]

Based on the information gathered in the first two workshops, the Commission sought comments on six (6) key topics in the third workshop, each of which is discussed in greater detail in the following section.

B. MEDSIS Workshops

Over the course of the three workshops held in this proceeding, the Commission heard presentations and received comments in the Formal Case No. 1130 docket from a number of interested persons. Below, Staff provides an overview of the topics discussed at the workshops as well as a synthesis of the comments filed by participants. A complete list of all of the stakeholders who gave presentations at the three workshops and filed comments in this proceeding is provided in Appendix G to this Report.[58] Comments are available for review and print on the Commission's eDocket by visiting our website www.dcpsc.org/medsis.

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[57] *Formal Case No. 1130*, Order No. 18144, ¶ 3, rel. March 17, 2016.

[58] Staff notes that while the workshops were open for public attendance and the Formal Case No. 1130 docket remains open for the receipt of public comments, the opportunity to give a presentation at the workshops was limited to particular presenters to address the issues raised by Commission Staff and in Commission Orders. Staff recognizes that some workshop attendants believed that the workshops should have allowed for more direct participation by ratepayers. However, the workshops were intended to be an initial phase to help frame the issues for Staff and sharpen them for later public participation. As indicated in this Staff Report, Staff envisions broad public participation in the MEDSIS Initiative going forward as actual decisions are being made by the Commission. Initially, public input is sought on the entirety of this Report, including the MEDSIS Pilot Project Grant Funding Parameters contained in Section VII as well as the Notice of Proposed Rulemakings issued concurrently with this Report. As reflected in Staff's Recommendations and the Implementation Timetable, Staff also proposes that the Commission hold a Town Hall meeting to garner broad public input on implementing the MEDSIS Initiative that the

The Commission and Staff greatly appreciate all of the participation from interested persons, which we believe is reflected in this Report and has helped inform the recommendations presented herein. Staff believes that the MEDSIS initiative has been and will need to continue to be a collaborative effort as we take the necessary steps forward to implement the recommendations outlined in this Staff Report.

C. Key Takeaways from Stakeholder Comments

1. Topic One: Support and Facilitate Distributed Generation

> How can the Commission support and facilitate the review and approval of distributed generation facilities that are in the public interest? Specifically, what type of review criteria should be used in the approval process (*e.g.*, environmental, safety, and zoning), what timelines should be implemented, and how should public input be considered?[59]

In response to this topic, several Stakeholders assert that the Commission needs to categorize the different types of DER facilities in order to determine which rules and regulations apply to the specific technologies. For example, one commenter asserts that the Commission can better facilitate the review and approval of distributed generation ("DG") facilities by first adopting 10 categories of distributed generating facilities. The 10 recommended categories include backup generators, Net Energy Metering (NEM) facilities, CREFs, qualified facilities under PURPA, wholesale generators, behind-the-meter generators, demand response resource, utility-owned solar facilities, microgrids and energy storage.[60] Specifically with respect to microgrids, some stakeholders recognize that microgrids fall into different categories and structures; like campus-style, community-based, and public purpose microgrids.[61]

Other Stakeholders indicate that "[i]n the simplest instance, the DC Public Utilities Code's definition of 'Electric Company' currently excludes self-supply with on-site generation, which allows for development and continued expansion of single customer microgrids, including ones

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public wants to the Commission to consider. At any point in this proceeding, however, if a member of the public believes that an idea or approach has been overlooked, they are free to bring it to Staff's attention by filing comments in the Formal Case No. 1130 docket.

59 Order No. 18144, ¶ 6.

60 *Formal Case No. 1130*, Potomac Electric Power Company Comments to Order No. 18144, at 6, filed April 18, 2016 ("Pepco's Comments to Order 18144").

61 Pepco's Comments to Order 18144 at 17, *Formal Case No. 1130*, Urban Ingenuity Comments to Order No. 18144, at 5, filed April 18, 2016 ("Urban Ingenuity Comments to Order 18144"), *Formal Case No. 1130*, Pennoni Comments to Order No. 18144, at 4, filed April 18, 2016 ("Pennoni Comments to Order 18144"), and *Formal Case No. 1130*, Microgrid Resources Coalition Comments to Order No. 18144, at 5, filed April 18, 2016 ("MRC Comments to Order 18144").

operated by a designee of the owner(s)."[62] Additionally, the stakeholder comments provide that "current regulations also allow for a utility-microgrid partnership, in which the utility owns the wires within the microgrid, while a microgrid developer or customers retain ownership of the included generation."[63] Another, commenter states that by "[e]stablishing simple categories of microgrids," "straightforward packages of regulation" can be developed.[64] According to one commenter, a key question before this Commission is who can own a microgrid – only public utilities or also competitive entities?

Several stakeholders suggest that the Commission establish a "streamlined and pro-forma approval process" in order to facilitate review and approval of DG Facilities.[65] Specifically, one stakeholder recommends that the Commission adopt a "tiered approval process based on the distributed generation facility's: (1) technology type; (2) generating capacity; (3) physical location; and (4) industry peer review certification."[66] The stakeholder asserts that taking a tiered approach will help the Commission facilitate DER deployment by "laying out precisely how different types of [DG] will be approved under D.C. Code § 34-1516" and lessening "the administrative burden of seeking approval by pre-qualifying certain types of" DG.[67] Two stakeholders believe that the need for the Commission's Notice of Construction ("NOC") process will also be based on the tier that the DER facility falls into.[68] Another stakeholder suggests the implementation of pilot projects to test the proposed rules and determine whether the projects advance the Commission's goals.

Several stakeholders assert that the process for interconnection approvals must be improved as currently there are too many uncertainties placed on project developers by long and inconsistent timelines.[69] Several commenters agree that the "Commission should focus on eliminating

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62 *See, e.g.*, MRC Comments to Order 18144 at 5.

63 MRC Comments to Order 18144 at 5.

64 Urban Ingenuity Comments to Order 18144 at 5.

65 *Formal Case No. 1130*, U.S. General Services Administration Comments to Order No. 18144, at 3, filed April 18, 2016 ("GSA Comments to Order 18144"); Pennoni Comments at 4; and *Formal Case No. 1130*, DC Climate Action Comments to Order No. 18144, at 2, filed April 18, 2016 ("DC Climate Action Comments to Order 18144"). In its filing GSA provides a bulleted list of considerations for the streamlined approval process, including: identifying key criteria, acceptable sources of power, necessary zoning approvals, required reliability studies, required interconnection agreements, etc.

66 Pennoni Comments to Order 18144 at 4.

67 Pennoni Comments to Order 18144 at 4.

68 Pepco's Comments to Order 18144 at 7-8 and Pennoni Comments to Order 18144 at 4.

69 *Formal Case No. 1130*, Washington Gas Light Energy Services, Inc. and Washington Gas Light Energy Systems, Inc. Comments to Order No. 18144, at 6, filed April 18, 2016 ("WGL Energy Comments to Order 18144"), *Formal Case No. 1130*, Maryland-DC-Virginia Solar Energy Industries Association Comments to Order No. 18144, at 2, filed April 18, 2016 ("MDV-SEIA Comments to Order 18144"), and *Formal Case No. 1130*, District of Columbia Government Department of Energy and Environmental Comments to Order No. 18144, at 6-7, filed April 18, 2016 ("DOEE/DCG Comments to Order 18144").

ambiguities in the application process, making information on potential technical obstacles readily available to developers early in the project development cycle," including a clear statement of the criteria for interconnection approval and publishing the capacity available for additional interconnections on individual circuits.[70]

In addition, stakeholders support the use of "lightened" regulation to address the issue of whether a DER operator engaging in retail sale of electricity is an "electric company and for regulating microgrids that both protects consumers and allows them to benefit from enhanced services and product innovation."[71]

Finally, a stakeholder asserts that the "[c]haracterization of the Energy Services Platform Provider should address what role the monopoly distribution utility should play in load management and whether this role should be opened to competitive bidding." Further, the Commission should consider what "tariff structures need to change in order to enable and expedite technology adoption and other desirable policy prescriptions."[72]

2. Topic Two: Adequacy of Current Commission Regulations

> Are the Commission's current regulations adequate and appropriate to regulate the construction, operation, and maintenance of distributed generation facilities and microgrid facilities?[73]

Stakeholders recognize that the Commission's current regulations are not adequate to address modern technologies and facilities like DERs, and therefore need to be updated. Among the host of changes recommended by stakeholders, many of which will be discussed in greater detail individually, some of the most pertinent are: (1) the Commission should modify the current definition of "Generating Facility" to exclude "non-parallel systems;" (2) the definition of "eligible customer-generator" should be changed to explicitly exclude NEM facilities; (3) revise Commission Rule 2902 to expand the types and sizes of electric generating facilities; and (4) adopt new, streamlined interconnection rules.[74]

With respect to microgrids, a commenter states that the current regulatory framework may or may not include microgrids (*See* D.C. Code §§ 34-1516 and 34-205) and that the microgrid technology does more than just "generate" or "cogenerate" – those facilities may also store,

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70 *See, e.g.*, MDV-SEIA Comments to Order 18144 at 2.

71 DOEE/DCG Comments to Order No. 18144 at 6-7 and Urban Ingenuity Comment to Order No. 18144 at 5.

72 *Formal Case No. 1130*, Grid 2.0 Working Group Comments to Order No. 18144, at 7, filed April 18, 2016 ("Grid2.0 Comments to Order No. 18144").

73 Order No. 18144, ¶ 6.

74 *See, e.g.*, WGL Energy Comments to Order 18144 at 14.

import, export, and transmit energy across a network of facilities.[75] Another stakeholder argues that for the microgrid projects that engage in the "retail sale" of electricity, the type of regulation will "vary greatly in terms of size, generation source, arrangement, and operation and ownership structure."[76] Also, a stakeholder advocates for issuing new regulations for sophisticated DERs (such as microgrids) to oversee the construction, operation, and maintenance – like "requiring installers, operators and maintainers of microgrids to be licensed by the Commission through a pre-qualification process" that would include safety standards, posting a performance bond, and incident reporting requirements.[77]

Several commenters agree that the Commission should adopt a definition for "Microgrid" as well as "Distributed Energy Resource," which are currently undefined in the District.[78] Stakeholders suggest that a modification to the definition of "sale," that would facilitate anticipated Smart Grid and DER, could be carefully developed by stakeholders.[79] While these changes and rule adoptions are needed, some stakeholders assert that "the current set of regulations contain adequate concepts that could be modified, if necessary . . . to oversee [ ] pilot project[s]."[80]

Additionally, commentators note that "the Commission currently does not regulate the siting, construction, and operation of distributed generation ("DG") facilities using renewable sources . . . as long as those facilities are not engaged in the business of selling electricity directly to ratepayers." However, stakeholders assert that the Commission should not change this practice, but should "retain the limited role of ensuring that all applicable environmental permits and zoning approvals have been obtained" by "traditional, fossil-fuel generation facilities."[81]

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75 GSA Comments to Order 18144 at 5.

76 DOEE/DCG Comments to Order 18144 at 10.

77 Pennoni Comments to Order 18144 at 8.

78 WGL Energy Comments to Order 18144 at 20, GSA Comments to Order 18144 at 5, DOEE/DCG Comments to Order 18144 at 12, and *Formal Case No. 1130*, Office of the People's Counsel Comments at 3, filed June 17, 2016 ("OPC Comments to Order 18144").

79 *See, e.g.*, DOEE/DCG Comments to Order 18144 at 11.

80 *See, e.g.*, DOEE/DCG Comments to Order 18144 at 10.

81 *See, e.g.*, DOEE/DCG Comments to Order 18144 at 9.

3. Topic Three: Barriers

> Are the current regulations a barrier to the development of distributed generation facilities, and if so, what type of regulatory structure would be appropriate for these kind of facilities and why?[82]

Stakeholders identified several regulatory barriers in the Commission's current regulations. Among the barriers that commenters asserted prevent DER penetration and advancement of energy delivery modernization efforts are: (1) lack of a streamlined certification process for solar generation;[83] (2) limiting net metering services for distributed generation to 1MW or less; (3) lack of a streamlined certification process for fuel cells and CHPs approximately 5-20MW; (4) lack of enforcement provisions related to interconnection regulations; and (5) enhanced consumer protection procedures for rule violators.

Several commenters focused on the need for streamlined interconnection procedures for solar energy facilities and compliance with the District's RPS Standard.[84] Other commenters asserted that the Commission should allow any DER that complies with existing rules and regulations to interconnect and that the Commission should establish a procedure for handling disputes between the utility and the owner or operator of the distributed generation ("DG"). The District Government advocates for the creation of a regulatory structure that allows a customer to: (1) connect to the grid for no more than the cost of connecting to the grid; (2) pay for the grid in proportion to how much and when they use the grid; and (3) receive full and fair value for delivering power to the grid.[85] In order to achieve these goals, the District Government advises the Commission to "consider providing a gradual path to near-time or real-time economic signals that would be visible to DER providers."[86]

Stakeholders also propose the use of light touch regulation to allow "a non-utility microgrid owner to provide power to other entities, subject to *partial* and *limited* application [ ] of utility regulations."[87] Commenters assert that ultimately the Commission should work to amend or reform D.C. Code provisions and Commission rules to limit regulatory uncertainty.[88]

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[82] Order No. 18144, ¶ 6.

[83] *See, e.g.,* WGL Energy Comments to Order 18144 at 12. "Under current rules unless a competitive provider is planning to construct a solar generator that fits within the parameters of 15 DCMR § 2902.1 [ ] the provider must seek and obtain Commission approval" and "any distributed generation plant that is not a solar generator of 5 MW or less (or 10 MW or less if built on the property of the DC Government) must" comply with 15 DCMR §§ 2101.1-2101.7, 2102, 218, and 2100."

[84] *See, e.g.*, MDV-SEIA Comments to Order 18144 at 4; Pennoni Comments to Order 18144 at 6.

[85] *See, e.g.*, DOEE/DCG Comments to Order 18144 at 7.

[86] *See, e.g.*, DOEE/DCG Comments to Order 18144 at 7.

[87] *See, e.g.*, DOEE/DCG Comments to Order 18144 at 10-11.

[88] *See, e.g.*, Pennoni Comments to Order 18144 at 13.

4. Topic Four: Retail "Sale" of Electricity

> What constitutes the retail or wholesale "sale" of electricity produced by a distributed generating facility?[89]

Stakeholders assert that a retail sale occurs when electricity is sold to an end user. A wholesale sale occurs when electricity is sold for re-sale (*i.e.*, electricity is not consumed by the purchaser but, rather, is re-sold by the purchaser).[90] Also, as pointed out by several commenters, the Federal Power Act ("FPA") "defines 'wholesale' sale as a 'sale of electric energy to any person for resale'" and a "retail" sale is a sale to an end-use customer. Therefore, Pennoni asserts a sale between a DER and the utility or the wholesale market would be a "wholesale sale," because the utility or market would resell the electricity to other consumers and, furthermore, such sales may trigger FERC jurisdiction.[91]

Various stakeholders[92] argue that it is clear that "FERC regulates 'the sale of electric energy at wholesale in interstate commerce' and wholesale electricity rates and any rule or practice 'affecting' such rates" but that "any other sale, including retail sale of electricity" is beyond FERC's authority.[93] Additionally, "[b]ecause it is difficult to determine that a unit of sold electric energy does not cross an interstate boundary, courts have held that <u>any wholesale sale of electricity is a wholesale sale in interstate commerce in those states that have an electric grid that crosses state boundaries</u>."[94]

Commenters also assert that pursuant to 16 U.S.C. § 824(b), "the Commission can bar consumers in the District from participating in the wholesale demand services market." Also a commenter asserts that there is no "sale" of power under the 1999 Act when: (1) a renewable distributed generator is certified by the Commission as a renewable resource and (2) the system owner sells

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89 Order No. 18144, ¶ 6.

90 *See, e.g.*, Pepco's Comments to Order 18144 at 25.

91 Pennoni Comments to Order 18144at 13-14.

92 OPC Comments to Order 18144 at 15; MRC Comments to Order 18144 at 6, fn. 12. Pennoni asserts that under the FPA the states have jurisdiction over: (1) any other sale of electricity, (2) facilities used for the generation of electric energy, (3) facilities used in local distribution or only for the transmission of electric energy in intrastate commerce, or (4) facilities for the transmission of electric energy consumed wholly by the transmitter, except as provided explicitly in federal law. Pennoni Comments to Order 18144 at 14.

93 WGL Energy Comments to Order 18144 at 26.

94 Pennoni Comments to Order 18144 at 14. "FERC recently reiterated this interpretation, stating that 'states have no authority outside of PURPA to set the price at which wholesale energy must be purchased.'" *California Pub. Utils. Comm'n*, 132 F.E.R.C. 61,047 at P 18 (2010) (emphasis added).

all of the output of the renewable generator to a single, host customer.[95] A smart grid that offers ancillary and energy services to PJM is engaging in the wholesale sale of power.[96]

Other commenters allege that FERC rejected the contention that "the export of excess energy generation of a net metering facility to the grid could constitute a sale to the utility – which, in turn, would render the underlying sale FERC jurisdictional."[97] Instead, FERC concluded, "where there is no net sale over the billing period [ ] FERC's jurisdiction is not implicated; that is, FERC does not assert jurisdiction when the end-use customer that is also the owner of the generator receives a credit against its retail power purchases from the utility. However, 'if the end-use customer participating in the net metering program produces more energy than it needs over the applicable billing period, and thus is considered to have made a net sale of energy to a utility over the applicable billing period,' the underlying sale would, in fact, be FERC jurisdictional."[98]

In addition, a stakeholder asserts that if a facility is not a Qualified Facility[99] but there is a purchaser for the energy produced by the facility, then that sale falls under FERC jurisdiction.[100] Stakeholders further assert that currently the most typical DER facility in the District is solar, and that where "solar energy generation is consumed on-site and excess energy is fed back into the grid (*i.e.*, net energy meter)," FERC has made it clear that "it does not view this practice as a sale of electricity subject to [FERCs] exclusive jurisdiction over wholesale sales." Commenters also contend that net metering is an accounting method that really allows excess credits to be rolled over into the customer's following billing period.

Some stakeholders while not providing a workable definition, note that the definition of "sale" was developed when there was only one-way power flow and now the "existing definition is rigid."[101] Therefore, they suggest a modification to the definition of "sale" that would facilitate anticipated Smart Grid and DER, carefully developed by stakeholders.[102] However, for "the

95 *See, e.g.*, WGL Energy Comments to Order 18144 at 20.

96 WGL Energy Comments to Order 18144 at 22.

97 *See, e.g.*, OPC Comments to Order 18144 at 15.

98 OPC Comments to Order 18144 at 15-16 and Pennoni Comments to Order 18144 at 14.

99 Under the Public Utility Regulatory Policies Act of 1978 ("PURPA"), a Qualifying Facility is either: (1) a small power production facility generating 80 MW or less whose primary energy source is renewable, biomass, waste, or geothermal resources with some limited exceptions; or (2) a cogeneration facility that sequentially produces electricity and another form of useful thermal energy in a way that is more efficient than the separate production of both forms of energy. *See* 18 C.F.R. §§ 292.203(a) and 292.203 (b); see also Federal Energy Regulatory Commission, "What is a Qualifying Facility," June 30, 2016. www.ferc.gov/industries/electric/gen-info/qual-fac/what-is.asp

100 MDV-SEIA Comments to Order 18144 at 4.

101 DOEE/DCG Comments to Order 18144 at 11.

102 DOEE/DCG Comments to Order 18144 at 11.

limited and specific purpose of facilitating a pilot non-utility owned microgrid project involving multiple parties, the Commission could provisionally adopt a definition."[103] Lastly, some stakeholders assert that "no retail or wholesale 'sale' of electricity is involved when a distributed generation ("DG") facility is serving the needs of its owner(s) or a limited set of users."

5. Topic Five: Jurisdictional Issues

> Some demand response facilities "shed load" by ramping up distributed generation – an action that could adversely impact the reliability of the electric grid. Due to current federal/state jurisdictional structures, there can be a lack of clarity with respect to what regulatory body governs the actions of a demand response facility. What should be the Commission's role in this instance?[104]

Stakeholders raised FERC's seven factors for assessing whether a facility is a local distribution facility subject to state jurisdiction or a facility engaging in interstate transmission subject to FERC jurisdiction outlined in FERC Order 888.[105] Other commenters noted that the U.S. Supreme Court's decision in *FERC v. Electric Power Supply Association*, affirms FERC's decision in Order 745, which mandates that demand response be compensated at the same rate as generation.[106] Stakeholders also stressed the importance of demand response in providing marginal capacity within PJM.[107]

Several parties rejected the wording of the Commission's topic question because it implies that demand response through the use of distributed generation ("DG") "could adversely impact the reliability of the electric grid."[108]

Commenters note that "PJM is currently considering procedures under which a microgrid could flexibly provide both demand response and dispatchable generation and ancillary services,

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103 DOEE/DCG Comment to Order 18144s at 12.

104 Order No. 18144, ¶ 6.

105 *See* OPC Comments to Order 18144 at 17. The seven factors are: (1) Local distribution facilities are normally in close proximity to retail customers; (2) Local distribution facilities are primarily radial in character; (3) Power flows into local distribution systems, it rarely, if ever, flows out; (4) When power enters a local distribution system, it is not reconsigned or transported to some other market; (5) Power entering a local distribution system is consumed in a comparatively restricted geographical area; (6) Meters are based on the transmission/local distribution interface to measure flows into the local distribution system; (7) Local distribution system will be of reduced voltage. *See also*, 75 FERC ¶ 61,080 (1996).

106 *See* MDV-SEIA Comments to Order 18144 at 6,and MRC Comments to Order 18144 at 4. Referencing *FERC v. Electric Power Supply Ass. et al.*, 577 U.S. ___, 136 S.Ct. 760, 193 L.Ed2. 661 (2016) (*FERC v. EPSA*).

107 *See, e.g.*, MRC Comments to Order 18144 at 4.

108 *See* GSA Comments to Order 18144 at 6; GRID2.0 Comments to Order 18144 at 4-5; MRC Comments to Order 18144 at 4. Responding to the language in *Formal Case No. 1130*, Order No. 18144, ¶ 6, rel. March 17, 2016.

depending on what resources are available and which resource would provide the greatest benefit to the regional grid."[109] Finally, Stakeholders also assert that in order to protect the local distribution grid, microgrids would have to interconnect and obtain approval for parallel operation in compliance with Commission established standards and procedures.[110]

6. Topic Six: Regulations in Other Jurisdictions

> What statutory provisions or regulations adopted in, or proposed for, another jurisdiction should the Commission review and consider to promote a more modern energy system in the District of Columbia?

Stakeholders pointed to regulations and proceedings in Maryland, New York, California and Minnesota as potential models for the Commission to follow. Commenters asserted that the Commission could review Maryland's Certificate of Public Convenience and Necessity process in looking at the definition of "generation station." [111] Several commenters directed the Commission's attention to the New York REV proceeding generally[112] and in particular the distribution systems operators ("DSOs") model which in the long-term aims to "support widespread competition in the distribution market in an analogous way that the creation of ISOs created real competition in the transmission and wholesale market."[113]

Stakeholders also asserted that there are two models to promoting grid modernization evidenced in the California proceeding and NY REV proceeding. In California, there is a data-driven process implementing more technology like advanced metering, while reducing retail-rate net metering as well as some "non-bypassable" charges for new net-metered customers like transmission charges.[114] Regulators have separated the NY REV proceeding into two tracks: (1) focusing on the development of distributed resource markets and the utility as a DSP provider; and (2) focusing on reforming utility ratemaking practices and revenue streams to accommodate the DSP provider model – with pilot projects testing DER integration, customer data sharing, third party partnerships, etc.[115] Stakeholders also urge the Commission to "consider an integrated planning process similar to those implemented by New York and California."[116]

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109 *See, e.g.*, WGL Energy Comments to Order 18144 at 24.

110 *See, e.g.*, WGL Energy Comments to Order 18144 at 24. WGL Energy also directs the Commission's attention to *FERC v. EPSA*.

111 *See, e.g.*, Pepco's Comments to Order 18144 at 25-26.

112 *See, e.g.*, Pepco's Comments to Order 18144 at 25-26.

113 *See, e.g.*, Pennoni Comments to Order 18144 at 14.

114 *See, e.g.*, MDV-SEIA Comments to Order 18144 at 6-7.

115 MDV-SEIA Comments to Order 18144 at 7.

116 *See, e.g.*, MRC Comments to Order 18144 at 7.

V. LEGAL & REGULATORY ASPECTS OF MEDSIS

Below, Staff discusses some of the key legal issues and, to the extent appropriate, has divided this section into topics. Within each of those topics Staff provides an overview of the existing legal and regulatory framework; identifies the legal and regulatory challenges in light of the existing framework, including discussions of relevant stakeholder comments; and provides Staff Recommended Actions ("RAs") to address the issues.

A. Light Touch Regulation

Several commenters in the MEDSIS initiative have suggested that the Commission employ light touch regulation as a means to both facilitate the rapid deployment of DERs in the District and to avoid unnecessary legislation to change the rules and regulations related to the operation of the Utilities in the District.

Interest in light touch regulation typically grows when new technologies and consumer wants emerge and raise the question of whether existing regulation is relevant or, possibly, a barrier to needed changes. Light touch regulation has been described as regulation that does not involve – (a) the imposition of new burdens which may not be needed; or (b) the maintenance of burdens which have become unnecessary. The underlying notion is accepted that regulatory intervention should be restricted to cases where it yields a positive return vis-à-vis the relevant fallback – reliance on competitive markets. Additionally, many believe that competitive markets free from burdensome regulations "tend to promote better market discipline and more accurate pricing."[117] Light-touch's "basic idea is to let regulated entities experiment with compliance practices without a one-size fits all command, so long as outcomes satisfy the articulated principles. Shortcomings are remediated but not necessarily punished."[118] While light touch regulation is favored by many, it is not a call for complete deregulation. Instead, proponents assert that "when there are reasons to regulate, the regulatory strategies should avoid complexity; highlight clear lines of responsibility; emphasize market discipline; shun regulatory centralization; distrust regulators; and avoid constant changes to the rulebook."[119]

The Commission currently oversees much of the retail choice program within the District using a form of light-touch regulation as authorized by the Retail Choice Act. The existing light-handed regulatory framework could serve as a foundation that could be expanded and adjusted, at least initially, to foster energy efficiency, greater market participation by electric suppliers, DER owners and operators, service providers, and customers. Current regulations recognize different levels of Commission oversight depending on different classifications based on a variety of

[117] Oskari Juurikkala, *The Behavioral Paradox: Why Investor Irrationality Calls for Lighter and Simpler Financial Regulation*, 18 Fordham J. Corp. & Fin. L. 33, 92 (2012).

[118] Donald C. Langevoort, *The SEC, Retail Investors, and The Institutionalization of the Securities Markets*, 95 Va. L. Rev.1025, 1034 (2009).

[119] Oskari Juurikkala, *The Behavioral Paradox: Why Investor Irrationality Calls for Lighter and Simpler Financial Regulation*, 18 Fordham J. Corp. & Fin. L. 33, 93 (2012).

characteristics, including size, operational complexities, public purpose, reliability, and consumer protection needs. This application of different levels of regulatory oversight could serve as a model in defining the appropriate scope of Commission authority over microgrids, for example, that could range from limited oversight of single-owner campus microgrids, to full regulation of public interest community microgrids.

While certain aspects of DER operations, in particular, like health and safety protections, may require well-crafted regulation, it is important that any regulatory approaches deployed be matched carefully to the challenge at hand. Throughout this Report, Staff questions whether regulations, rules, and procedures being discussed are ripe for the application of light touch regulation.

B. Distributed Energy Resources

Two of the most discussed topics by stakeholders in this proceeding have been: (1) what constitutes a distributed energy resource; and (2) how should various types of distributed energy resources ("DER") be categorized and, therefore, regulated by the Commission. This section of the Staff Report discusses these topics and proposes regulatory changes for the Commission's consideration.

1. Existing Legal & Regulatory Framework

As discussed earlier, the electricity supply markets in the District were restructured by the 1999 Act. This restructuring led to the divestiture of Pepco's electric generation assets. D.C. Code § 34-205 defines electric generating facilities as "all buildings, easements, real estate, mains, pipes, conduits, fixtures, meters, wires, poles, lamps, devices, and materials of any kind operated, owned, used, or to be used by a person for the generation of electricity. The term includes all buildings, easements, real estate, mains, pipes, conduits, fixtures, meters, wires, poles, lamps, devices, and materials of any kind operated, owned, used or to be used by a person for cogeneration of electricity."

The 1999 Act also provided the role, duties, and powers of the Commission (D.C. Code § 34-1504) and the duties of the electric company (D.C. Code § 34-1504) under this new regulatory frame work. As part of its duties, pursuant to D.C. Code § 34-1504 (c)(1)(H) "the Commission shall adopt regulations or issue orders to: Govern the construction of new electric generating facilities under 34-1516." Pursuant to D.C. Code § 34-1516, "no person shall construct an electric generating facility for the purpose of the retail or wholesale sale of electricity unless the Commission first determines, after notice and a hearing, that the construction of the electric generating facility is in the public interest." This requires the Commission to: (1) provide for notice and a hearing, and (2) determine that such a facility is in the public interest. This provision does not require Commission approval of all new generation facilities but only those facilities that sell the electricity they generate.

In response to D.C. Code § 34-1516, the Commission developed regulations for reviewing and approving the construction of a generating facility. The Commission's rules are found in 15 DCMR Chapter 21, (Provision for Construction of Electric Generating Facilities and

Transmission Lines). Specifically, 15 DCMR § 2100.2 restates verbatim the provisions of D.C. Code § 34-1504 (c)(1)(H) requiring Commission approval of generating facilities that sell electricity. As part of the above provisions under 15 DCMR § 2112.1, "the Commission may, in its discretion, *waive or modify* any provision of this Chapter . . .," within the bounds of D.C. Code § 34-1516's requirements.[120] Also, pursuant to 15 DCMR § 2112.2, "the applicant may, at the time of application, request that the Commission waive any provision in this Chapter for good cause shown," with the same caveat concerning D.C. Code § 34-1516.

As previously mentioned, the Act also provided the duties of the electric company. D.C. Code § 34-1506 (a)(1) states that the "electric company shall provide distribution services to all customers and electricity suppliers on rates, terms of access, and conditions that are comparable to the electric company's own use of its distribution system. The electric company shall not operate its distribution system in a manner that favors the electricity supply of the electric company's affiliates." D.C. Code § 34-1506 (a)(2) states: "To the extent this provision is not preempted by federal law or regulation, the electric company shall provide transmission services to all customers and electricity suppliers on rates, terms, and conditions that are comparable to the electric company's own use of its transmission system;" and D.C. Code § 34-1506 (b) states: "The electric company shall maintain the reliability of its distribution system in accordance with applicable orders, tariffs, and regulations of the Commission."[121]

Furthermore, with regard to microgrids, which are discussed in more detail below, there may be two factors to consider when determining whether D.C. Code § 34-1516 applies. One factor is the size of the generating facility. The interconnection rules under Chapter 40 of Title 15 of the DCMR may sufficiently address a microgrid smaller than 10 MW, although some modification to the District's Small Generator Interconnection Rules ("DCSGIR") may be needed. Another factor is the configuration of the microgrid itself and whether the energy generated is sold to customers on a per-kWh basis. Such consideration must be given in the instance of a community microgrid, or in the event a campus microgrid is permitted to export net energy onto the electric company's distribution network.

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[120] This language presents an opportunity for the Commission to use light touch regulation to waive or modify certain rules to facilitate DER penetration.

[121] D.C. Code § 34-1506 (a)(1), (2) and (b).

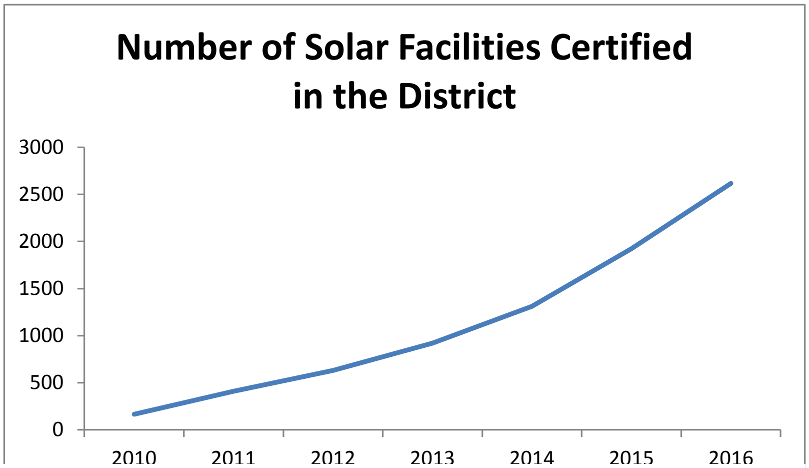

FIGURE 3: NUMBER OF CERTIFIED SOLAR FACILITIES IN D.C.

Several types of DERs also fall into the category of renewable generation. Under the Renewable Energy Portfolio Standards ("RPS") Law, D.C. Code §§ 34-1431 et seq., renewable distributed generation systems require certification by the Commission. Renewable distributed generation includes customer generation, which is defined as "generation that is not principally dedicated to selling power into the wholesale market."[122] D.C. Code § 34-1431 defines an Electricity Supplier as "a person, including an aggregator, broker, or marketer, who generates electricity; sells electricity; or purchases, brokers, arranges or, markets electricity for sale to customers." The term excludes the following: "(A) Building owners, lessees, or managers who manage the internal distribution system serving such building and who supply electricity solely to occupants of the building for use by the occupants; (B)(i) Any person who purchases electricity for its own use or for the use of its subsidiaries or affiliates; or (ii) Any apartment building or office building manager who aggregates electric service requirements for his or her building or buildings, and who does not: (I) Take title to electricity; (II) Market electric services to the individually-metered tenants of his or her building; or (III) Engage in the resale of electric services to others."[123] D.C. Code § 34-1432 states: (a) The Commission shall implement a renewable energy portfolio standard which applies to all District of Columbia retail electricity sales, except as provided under subsection (b) of this section.[124]

15 DCMR § 2900 et al., establishes the Commission's rules and regulations governing RPS' applicable to an Electricity Supplier as provided in D.C. Code §§ 34-1431 through 34-1439. Specifically, 15 DCMR § 2902.1 provides that renewable generators, including behind-the-meter generators must be certified as a qualified resource by the Commission to produce and sell renewable energy credits.[125]

[122] D.C. Code § 34-1431 (3).

[123] D.C. Code § 34-1431 (6)(A); (B)(i),(ii)(I), (II), and (III).

[124] D.C. Code § 34-1432 (2016).

[125] Applications for certification of solar generators under the above requirements are set forth in 15 DCMR § 2902.2, and additional requirements pertaining to a Streamlined Application under 15 DCMR § 2902.5 or a Regular Application under 15 DCMR § 2902.6, as well as other requirements applicable to solar generation, are specified in detail in 15 DCMR §§ 2902.7-2921.

2. Define & Categorize Distributed Energy Resources

The D.C. Code and Commission rules currently do not provide a definition of distributed energy resource, nor is the complete range of categories of DER recognized within Title 34 of the Code or Title 15 of the DCMR. In Order No. 17851, issued in this proceeding, the Commission asked stakeholders to comment on how the Commission could support and facilitate the review and approval of distributed generation ("DG") facilities; specifically, what type of review criteria should be used in the approval process. In response to Order No. 17851, several stakeholders suggested the recognition and separation of the various types of DER systems into categories.

Urban Ingenuity asserted that by "[e]stablishing simple categories of microgrids straightforward packages of regulation" can be developed.[126] Pepco similarly suggests that the Commission adopt 10 categories of distributed generation facilities in order to address how the facility should be regulated and provides relatively detailed examples of those categories and how current Commission regulations should or should not be applied.[127] Notably, Pepco asserts that behind-the-meter generators that qualify as a "customer generator" should be exempted from the Commission's notice of construction ("NOC") process but subject to the Commission's interconnection process if not accessed by PJM. Pepco also asserts that back-up generators not running parallel to the distribution system should not be regulated by the Commission and the Commission should modify the definition of "Generating Facility" to excluding non-parallel systems like back-up generators.[128]

Additionally, Pepco provides guidelines for more complex DER systems like demand response resources, utility-owned solar facilities, microgrids, and energy storage devices.[129] Pepco notes that the fundamental question regarding all of these categories of DER is whether they "should be viewed as generation that must be regulated by the Commission and, if so, in what manner." Pepco goes on to say "certain types of DER should qualify for expedited treatment through a lower level of regulation."[130]

126 Urban Ingenuity Comments to Order 18144 at 5.

127 *See* Pepco Comments to Order 18144 at 7. The 10 suggested categories include: (1) backup generators, (2) NEM facilities, (3) CREFs, (4) facilities qualified under PURPA, (5) wholesale generators, (6) behind-the-meter generators, (7) demand response resource, (8) utility-owned solar, (9) microgrids, and (10) energy storage devices.

128 *See* 15 DCMR § 2199.1.

129 PHI asserts in the Interconnection Report that "energy storage should not be viewed as a form of renewable generation and needs to be evaluated to determine if it meets the requirements for net energy metering ("NEM")." *See* Interconnection Report at 37.

130 Pepco's Comments to Order 18144 at 7.

a. Distributed Energy Resource Defined

As discussed in MIT Energy Initiative's "Utility of the Future" report, "[p]ower systems around the world are becoming less centralized as the resources mix integrates distributed energy resources (DERs) and new options for providing and consuming electricity services emerge in the distribution system. In most power systems, DERs remain minor players in the provision of electricity services; nonetheless, smart energy consumption and DER deployment are generally on the rise."[131] Furthermore, as aptly pointed out in the "NARUC Manual on Distributed Energy Rate Design and Compensation," "[a]bsent direction from the legislature, a regulator may need to define DER, or at least provide guidance to utilities, customers, and other stakeholders regarding the jurisdiction's viewpoint on what constitutes DER."[132] Staff agrees. Staff also acknowledges that while "[t]here is no single definition for a [DER]," generally speaking, DER refers to decentralized power generation and storage resources typically located close to the load they serve and operated for the purpose of supplying all or a portion of the customer's electric load, and that may also be capable of injecting power into the transmission and/or distribution system, or into a non-utility local network in parallel with the utility grid. DER consists of several types or categories of grid technologies designed to enhance or modernize the classic macrogrid.

However, the definition of DER and the range and scope of these technologies have not been set forth in the context of the District. **Staff believes it is appropriate to adopt a broad definition of DER instead of a narrow one that will not accommodate future advancements in technology, and as such Staff recommends that a Notice of Proposed Rulemakings ("NOPR") be issued to adopt a broad definition of DER in the District. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.**

b. DER Categorization

While it is important to adopt a definition of DER that is sufficiently broad to adapt to potential future technologies, it is also important to make sure that, in the absence of legislation, the different types or categories of existing DER technologies are addressed in Commission regulations so that stakeholders understand how those technologies may be regulated in the District. To that end, Staff believes DER can be broken down into five main categories, each with subcategories of technologies. Staff notes that some of the technologies identified in subcategories overlap the main categories. Furthermore, while the term "Distributed Energy Resources ('DER')" is not defined in the D.C. Code or the Commission Regulations, some of the DER technologies, or generation types, listed in Table 4 below, are already implemented in the District, such as some types of DG and electric vehicles.

131 "Utility of the Future: An MIT Energy Initiative Response to an Industry in Transition," MIT Energy Initiative, at 2, rel. 2016.

132 NARUC Manual on Distributed Energy Rate Design and Compensation, at 41, issued November 2016.

TABLE 4: CATEGORIES OF DER

CATEGORIES OF DER
1. Distributed Generation[133]
a. Renewable Generators
1. Solar PV Systems
2. Wind
b. Fossil Fuel Generators
c. Cogeneration (CHP)
d. Qualified Facilities under PURPA
e. Fuel Cells
f. Behind-the-Meter Generators
g. Microturbines
h. Net Energy Metering (NEM) Facilities
i. Back-up Generators
j. Community Renewable Energy Facility (CREF)
2. Energy Storage
a. Batteries
b. Electric Vehicles
c. Fly wheels
3. Energy Efficiency
4. Demand Response
5. Microgrids

To provide a framework for our discussion of the types of DER as well as the basis for proposing rule changes, Staff will discuss each of the main categories of DER and subcategories as well as identify where a particular type of DER is already addressed in District law or regulation.

c. Distributed Generation

Below, Staff identifies and discusses the types of Distributed Generation ("DG") that are already recognized to some degree in District law or regulation; including: (1) renewable energy, (2) fossil fuel generators, (3) cogeneration facilities, (4) qualified facilities under PURPA, (5) fuel cells, (6) microturbines, (7) behind-the-meter generators, (8) NEM facilities, (9) backup generators, and (10) CREFs. While **Staff recommends that a NOPR be issued to adopt a definition of Distributed Generation,** for the purposes of this report when discussing Distributed Generation staff means any electric generating facility, as defined in D.C. Code Section 34-205 which is connected to the electric distribution system in the District and subject to the Commission's Small Generator Interconnection Rules. **A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.**

133 "Distributed Generation" means any electric generating facility, as defined in D.C. Code Section 34-205 which is connected to the electric distribution system in the District and subject to the Commission's Small Generator Interconnection Rules.

i. Renewable Energy

Generally speaking, renewable energy is energy generated from natural resources like sunlight, wind, rain, tides, and geothermal heat which are naturally replenished.[134] As established in the D.C. Code renewable energy is addressed in D.C. Code §§ 34-1431 (15) and (16) which identify the specific types of renewable energy sources that are either "tier one" and "tier two" renewable energy resources eligible for the District's RPS program. The Commission has adopted the statutory provisions in our rules.[135] A tier one renewable source is defined as:

> one or more of the following types of energy sources:
> (A) Solar energy;
> (B) Wind;
> (C) Qualifying biomass used at a generation unit that achieves a total system efficiency of at least 65% on an annual basis, can demonstrate that they achieved a total system efficiency of at least 65% on an annual basis through actual operational data after one year, and that started commercial operation after January 1, 2007.
> (D) Methane from the anaerobic decomposition of organic materials in a landfill or wastewater treatment plant;
> (E) Geothermal;
> (F) Ocean, including energy from waves, tides, currents, and thermal differences; and
> (G) Fuel cells producing electricity from a tier one renewable source under subparagraph (C) or (D) of this paragraph.[136]

A tier two renewable source is defined as:

> One or more of the following types of energy sources:
> (A) Hydroelectric power other than pumped storage generation;
> (B) Waste-to-energy; or
> (C) Qualifying biomass used at a generation unit that:
> (i) Started commercial operation on or before December 31, 2006; or
> (ii) Achieves a total system efficiency of less than 65%; or
> (iii)Uses black liquor.[137]

Based on this information, Staff recommends that no action be taken amending these definitions.

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134 *What is Renewable Energy?*, Penn State Extension, Renewable and Alternative Energy, accessed November 30, 2016. http://extension.psu.edu/natural-resources/energy/what

135 *See* 15 DCMR § 2999 (2016).

136 D.C. Code §§ 34-1431 (15).

137 D.C. Code §§ 34-1431 (16).

ii. Fossil Fuel Generators

The term fossil fuel is not expressly defined in the D.C. Code or Commission rules. However, fossil fuels are mentioned in D.C. Code § 50-301.03 (2) as being excluded from the term "Alternative fuels" appropriate for powering vehicles.[138] Specifically, that code provision states: "'Alternative fuel' means advanced fuels, which can be any materials or substances that can be used as fuels, other than conventional fuels such as fossil fuels, including biodiesel, compressed natural gas, electricity, and ethanol. The term 'alternative fuel' shall also apply to hybrid vehicles that use alternative forms of power such as electricity."[139] **Since there is no workable definition of fossil fuel generators in the D.C. Code or Commission regulations, Staff recommends that the Commission issue a NOPR to adopt a definition of fossil fuels generator. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.**

iii. Cogeneration Systems

D.C. Code § 47-1508(a)(12), as part of its taxation provisions, defines "cogeneration systems" as:

> Systems that produce both:
> (A) Electric energy; and
> (B) Steam or forms of useful energy (such as heat) that are used for industrial, commercial, heating, or cooling purposes.

Though this definition comes from outside the District's Public Utilities section in Title 15 of the D.C. Code, the definition is sufficient for use by the Commission. **Therefore, Staff recommends that the Commission issue a NOPR to adopt the definition of "cogeneration systems" identified above. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.**

iv. Qualified Facilities under PURPA

In an effort to improve its national energy plan and with the support of the environmental movement toward the use of natural gas and renewable fuels, Congress enacted the Public Utilities Regulatory Policies Act ("PURPA") in 1978 with the intent to decrease its reliance on imported oil, thereby increasing the production and use of alternative sources of energy in its energy market.[140] Provisions in the law, especially Section 210 of PURPA, state requirements companies must meet to qualify as a cogeneration facility or a small power production facility. Also the law provides rules on how traditional utility companies should interact with qualifying

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[138] D.C. Code § 50-301 deals with the regulation of Taxicabs.

[139] D.C. Code § 50-301.03 (2).

[140] Public Utilities Regulatory Policies Act of 1978 ("PURPA"), Pub. L. 95-617, 92 Stat. 3117, enacted November 9, 1978.

facilities. Of the many requirements listed, two of them are constant in dispute among FERC and utility companies. They include the provision which requires, (i) the electric utilities to buy electricity generated by the small power producers at an approximate cost the utility would have incurred if it were to generate the same amount of electricity,[141] and (ii) the provision requiring utility companies to supply backup power to small power producers.[142] Additionally, PURPA directed the Federal Regulatory Commission ("FERC"), to establish rules regarding rates for purchases by electric utilities with the consideration that the rates must be "(i) just and reasonable to the electric consumers of the utility, (ii) in the public interest, and (iii) not discriminatory against [qualifying facilities]."[143] Currently many state commissions are implementing or have implemented regulations governing qualified facilities interactions.[144]

Given that these are federal regulations, Staff recommends that no action be taken.

v. Fuel Cells & Microturbines

There is no specific definition for fuel cell or microturbines in the D.C. Code or Commission regulation. Generally, a fuel cell produces electricity through a chemical reaction, but without combustion. It converts hydrogen and oxygen into water, and, in the process generates electricity. The byproducts from fuel cells are heat and water vapor.[145] Microturbines are "a simple form of gas turbine, usually featuring a radial compressor and turbine rotors and often using just one stage of each. They typically recover exhaust energy to preheat compressed inlet air, thereby increasing electrical efficiency compared with a simple-cycle machine . . . Microturbines provide high electrical efficiency compared with traditional gas turbines in the same size class."[146]

Fuel cells are considered a renewable energy resource under the Commission's RPS Standards, found in D.C. Code §§ 34-1431 (15), if they produce electricity from either: (1) "Qualifying biomass used at a generation unit that achieves a total system efficiency of at least 65% on an annual basis, can demonstrate that they achieved a total system efficiency of at least 65% on an

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141 16 U.S.C. 824a-3(a)(1982).

142 16 U.S.C. 824a-3(a)(1982); *Consolidated Edison Co. v. Public Service Commission*, 63 N.Y.2D 424, 472 N.E.2D 981 (1984) (New York Court of Appeals concluded that avoided cost defined by PURPA and the Regulations thereunder is the maximum rate that may be imposed by [] FERC).

143 *Report of the Committee on Cogeneration and Small Production Facilities*, Energy L. J. at 183 (1986).*See also*, http://eba-net.org/sites/default/files/elj/Energy%20Journals/Vol7_No1_1986_Cogeneration.pdf.

144 Efforts by California, Colorado, Connecticut, Florida, Georgia, Hawaii, Indiana, Kansas, Massachusetts, Michigan, Mississippi, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Oklahoma, Pennsylvania, and Texas, just to name a few.

145 *See ,What is a Fuel Cell?*, Canadian Hydrogen and Fuel Cell Association, CHFCA Clean Energy Now, accessed November 30, 2016. http://www.chfca.ca/education-centre/what-is-a-fuel-cell/

146 Stephen Gillette, *Microturbine Technology Matures*, Power Magazine, November 1, 2010. http://www.powermag.com/microturbine-technology-matures/?pagenum=1

annual basis through actual operational data after one year, and that started commercial operation after January 1, 2007;" or (2) "Methane from an anaerobic decomposition of organic materials in a landfill or wastewater treatment plant."[147]

Fuel cells and microturbines are mentioned under D.C. Code §§ 34-1501 (15) and 34-1518 (2) in the context of "Customer-generators." Specifically, under D.C. Code § 34-1501 (15), a customer generator includes any residential or commercial that owns or operates an electric generator facility that uses renewable resources, cogeneration, fuel cells, or microturbines. Under § 34-1518 (2) an eligible customer-generator's net metering systems for fuel cells and microturbines must meet all applicable safety and performance standards in addition to being subject to any Commission regulations that may be adopted placing additional control and testing requirements on customer-generators.[148]

Therefore, Staff recommends issuing NOPRs to adopt definitions of fuel cells and microturbines. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.

vi. Behind-the-Meter Generators

The term "behind-the-meter generator" is defined as part of the Commission's RPS rules in 15 DCMR § 2999 as:

> a renewable on-site generator that is located behind a retail customer meter such that no utility-owned transmission or distribution facilities are used to deliver the energy from the generating unit to the on-site generator's load.

Based on the fact that the Commission has a sufficient definition of behind-the-meter generators, Staff recommends that no new definition is needed.

vii. Net Energy Metering (NEM) Facilities

While the term Net Energy Metering Facilities ("NEM") is not a specifically defined term under the Commission's rules, the term refers to facilities that meet two definitions under the Commission's Net Metering Rules in 15 DCMR 999. The first term is "eligible customer-generator," which means:

> a customer-generator whose net energy metering system for renewable resources, cogeneration, fuel cells, and microturbines meets all applicable safety and performance standards

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147 D.C. Code § 34-1431 (15) (C), (D), and (G).

148 *See, generally*, D.C. Code §§ 34-1501(15), 34-1518 (2).

The second term is "customer-generator," which expands upon the statutory definition provided in D.C. Code § 34-1501 (15), and the Commission defines it as:

> means a residential or commercial customer that owns (or leases or contracts) and operates an electric generating facility that: (a) has a capacity of not more than 1000 kilowatts; (b) uses renewable resources, cogeneration, fuel cells, or microturbines; (c) is located on the customer's premises; (d) is interconnected with the Electric Company's transmission and distribution facilities; and (e) is intended primarily to offset all or part of the customer's own electricity requirements.

Therefore, Staff recommends that the Commission issue a NOPR to clarify that NEM facilities are synonymous with "eligible customer generators" under 15 DCMR § 999.

viii. Back-up Generators

There is no explicit definition of back-up generators in the D.C. Code or Commission rules. However, 15 DCMR § 4099 contains Pepco's interconnection agreement, which exempts back-up generation of units that do not operate in parallel with the main generation source for more than 100 milliseconds.[149] **Therefore, Staff recommends that the Commission issue a NOPR to adopt a definition of back-up generator. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.**

ix. Community Renewable Energy Facility (CREF)

The Commission defines "Community renewable energy facility" or "CREF" in as part of the Commission's Net Metering Rules in 15 DCMR 999, which builds on the definition in D.C. Code § 34-1501 (9B). The Commission's definition of a CREF is:

> an energy facility with a capacity no greater than five (5) megawatts that: (a) uses renewable resources defined as a Tier One Renewable Source in accordance with Section 3(15) of the Renewable Energy Portfolio Standard Act of 2004, effective April 12, 2005, (D.C. Law 15-340; D.C. Official Code § 34-1431(15) as amended); (b) is located within the District of Columbia; (c) has at least two (2) Subscribers; and (d) has executed an Interconnection Agreement and a CREF Rider with the Electric Company.

Because CREFs are adequately defined in the Commission's rules, Staff recommends no action be taken.

[149] 15 DCMR § 4099 - "Interconnection System Impact Study Agreement" (February 13, 2009).

d. Energy Storage

As discussed in the NARUC Manual Distributed Energy Resources Rate Design and Compensation, "[e]nergy storage can be used as a resource to add stability, control, and reliability to the electric grid. . . . There are a variety of storage types, from large storage resources (e.g., pumped hydro) to thermal storage (e.g., ice energy or electric waters) to chemical storage (e.g., flow batteries or solid state) and mechanical devices (e.g., flywheels). These different technologies provide different types of responses and services."[150]

The FERC in a NOPR on "Electrical Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators" issued on November 17, 2016 defined Energy Storage Resources as:

> a resource capable of receiving electric energy from the grid and storing it for later injection of electricity back to the grid regardless of where the resource is located on the electrical system. These resources include all types of electric storage technologies, regardless of their size, storage medium (e.g., batteries, flywheels, compressed air, pumped-hydro, etc.), or whether located on the interstate grid or on a distribution system.[151]

This definition is broader than what would be needed for the Commission's more limited jurisdiction but is useful nonetheless. The Commission's interest is centered on the storage of electricity so for clarity the term should be "electrical storage" in line with FERC's formulation as opposed to the term "energy storage" used by NARUC. Currently, there is no definition for electrical storage in the D.C. Code or in the Commission's rules. **Therefore, Staff recommends that the Commission issue a NOPR to adopt a definition for electric storage. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.**

i. Batteries

Generally, a battery "is a device that is able to store electrical energy in the form of chemical energy, and convert that energy into electricity."[152] There are different types of batteries, including solid state batteries and flow batteries.[153] There is no definition of battery in the D.C.

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[150] NARUC Distributed Energy Resources Rate Design and Compensation Manual, at 47-48 (November 2016).

[151] Electrical Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators, 81 Fed. Reg. 86522, 157 FERC ¶ 61,121 (proposed November 17, 2016) (to be codified in 18 C.F.R. 35).

[152] *How does a Battery Work?,* MIT School of Engineering, posted May 1, 2012 http://engineering.mit.edu/ask/how-does-battery-work

[153] *Energy Storage Technologies*, Energy Storage Association, accessed November 30, 3016. http://energystorage.org/energy-storage/energy-storage-technologies

Code or Commission rules. **Therefore, Staff recommends that the Commission issue a NOPR to adopt a definition of battery. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.**

ii. Electric Vehicles

D.C. Code §§ 50-1501 (12) states that "'Electric vehicle' shall have the same meaning as provided in section 3(4) of the Electric and Hybrid Vehicle Research, Development, and Demonstration Act of 1976, approved September 17, 1976 (90 Stat. 1261; 15 U.S.C. § 2502(4))." The 1976 Electric and Hybrid Vehicle Act §§ 3(4) and 3(5) provide:

> "electric vehicle" means a vehicle which is powered by an electric motor drawing current from rechargeable storage batteries, fuel cells, or other portable sources of electrical current, and which may include a nonelectrical source of power designed to charge batteries and components thereof"
>
> "hybrid vehicle" means a vehicle propelled by a combination of an electric motor and an internal combustion engine or other power source and components thereof."

As the definition for electric vehicle found in D.C. Code § 50-1501 (12) is adequate, Staff recommends that the Commission issue a NOPR adopting this definition. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.

iii. Fly-wheels

Generally, a fly-wheel is a heavy revolving wheel that is used to increase a machine's momentum and thereby provide greater stability or a reserve of available power during interruptions in the delivery of power; the wheel stores energy in excess and releases it when there is deficiency. According to the Energy Storage Association, "some key advantages of flywheel energy storage are low maintenance, long life [ ], and negligible environmental impact."[154] There is no explicit definition of fly-wheel in the D.C. Code or Commission rules. **Therefore, Staff recommends that the Commission issue a NOPR to adopt a definition of fly-wheel. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.**

e. Demand Response Resource

Demand response refers to the ability of a customer to curtail their consumption of electricity in response to market signals; this curtailment will be most valuable during times of peak demand when wholesale electricity prices are higher.

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154 Flywheels, Energy Storage Association, accessed November 30, 2016. http://energystorage.org/energy-storage/technologies/flywheels

The Federal Energy Regulatory Commission ("FERC") provides the following definition of demand response: "Demand response means a reduction in the consumption of electric energy by customers from their expected consumption in response to an increase in the price of electric energy or to incentive payments designed to induce lower consumption of electric energy."[155]

The demand response functionality is contained in whatever system communicates to the customer the need to curtail usage combined with some means of recording the curtailment and arranging for compensation. Commercial and industrial customers have participated in demand-response schemes for decades; however, only recently has interval metering become widespread in the residential sector.[156]

In order to achieve the demand response, the customer must have the ability to reduce usage of particular appliances or machinery; the curtailment can also be achieved by customers who can increase energy output from their BTM generator or storage. Distributed generators like cogeneration and micro-turbines along with other types of DER like electric vehicles or batteries have the potential to provide demand response. Greater efficiency can be achieved when the communication and response are automated.

Demand response compensation can involve wholesale and retail transactions. Compensation arrangements can be complex and are, at times, controversial. At the wholesale level, FERC requires market operators to pay the same price to demand response providers for conserving energy as to generators for producing it, so long as a "net benefits test," which ensures that accepted bids actually save consumers money, is met.[157] The U.S. Supreme Court recently turned back a challenge to this rule.[158] A type of demand-response program, known as direct load control, is available to residential customers in the District of Columbia.[159]

D.C. Code defines "Demand response generating source" to mean:

> a stationary generator subject to an agreement or obligation to provide power in response to power grid needs, economic signals from competitive wholesale electric markets, or special retail rates. The term "demand response generating source" shall not include a generator that derives its energy from an energy source that qualifies as a tier one renewable source under Chapter 14A of Title 34 [§ 34-1431 et seq.].

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155 18 C.F.R. 35.28.

156 Without interval metering, only limited forms of demand response are available for residential customers.

157 FERC Order No. 745. § 35.28(g)(1)(v).

158 FERC *v.* Electric Power Supply Ass'n, 136 S.Ct. 760 (2016) as revised (January 28, 2016).

159 *Formal Case No. 1086, In the Matter of the Investigation into the Potomac Electric Power Company's Residential Air Conditioner Direct Load Control Program* ("*Formal Case No. 1086*").

D.C. Code provides the following limitation on the use of a generator as a demand response generating source.

> (a) No person shall construct or operate an internal combustion engine as a demand response generating source unless the source implements, at a minimum, current best available control technology in accordance with a permit issued by the Director.
> (b) A demand response generating source shall not be classified or permitted as an emergency generator.
> (c) Nothing in this part shall prevent the Director from denying an application for or renewal of a permit for a demand response generating source to protect air quality or to encourage energy efficiency or conservation-based demand response in the District.[160]

D.C. Code established the following disclosure requirements for demand-response generators:

> A person who owns or operates an internal combustion engine as a demand response generating source shall track and submit an annual report disclosing the total number of hours, including the dates and times, that the source operated during the preceding year, and the total number of hours, including the dates and times, that the source operated as a demand response generating source during the preceding year, as well as any additional information the Director requires. The report shall be submitted to the District Department of the Environment by March 1, 2015, and annually on March 1 thereafter.[161]

Based on this information, Staff recommends that the Commission issue a NOPR to adopt FERCs definition of demand response. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.

f. Energy Efficiency

The federal government has authority to establish energy efficiency standards for manufactured products. Energy efficiency is defined as "the ratio of the useful output of services from a consumer product to the energy use of such product, determined in accordance with test procedures" established for individual product categories.[162]

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160 D.C. Code § 8–101.13.

161 D.C. Code § 8–101.12.

162 42 U.S.C. 77 § 6291.

Requiring manufacturers to sell only those products that meet minimum standards for energy efficiency is an important component of the nation's energy strategy. However, additional steps are needed to require or encourage consumers and businesses to purchase more efficient products. A good example is the Commission rule requiring Pepco to purchase transformers that comply with U.S. DOE energy efficiency standards.[163]

Local governments also have an important role to play in encouraging homeowners, landlords, developers, and businesses to adopt energy efficiency measures. D.C. Code provides the following definition:

> (10) "Energy Efficiency Improvement" means an installation or modification that is designed to reduce energy or water utility costs of residential, commercial, or other building types. The term "Energy Efficiency Improvement" includes:
>
> (A) Insulation in walls, roofs, floors, and foundations and in heating and cooling distribution systems;
>
> (B) Storm windows and doors, multiglazed windows and doors, heat-absorbing or heat-reflecting glazed and coated window and door systems, additional glazing, reductions in glass area, and other window and door system modifications that reduce energy consumption;
>
> (C) Automatic energy control systems;
>
> (D) Heating, ventilating, or air conditioning and distribution system modifications or replacement in buildings or central plants;
>
> (E) Caulking or weather-stripping;
>
> (F) Replacement or modifications of lighting fixtures to increase the energy efficiency of the system without increasing the overall illumination of a building unless the increase in illumination is necessary to conform to the applicable building code for the proposed lighting system;
>
> (G) Energy recovery systems;
>
> (H) Daylighting systems;
>
> (I) Renewable energy systems; and
>
> (J) Any other modification, installation, retrofit, or remodeling approved as an electric, gas, water, or stormwater utility cost-savings measure by the administrator.[164]

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163 "After January 1, 2010, and subject to reasonable commercial availability, the electric utility shall purchase liquid-immersed distribution transformers that meet or exceed the energy efficiency standards specified in the Department of Energy's ("DOE") final rules in Part 431 of Title 10 of the Code of Federal Regulations." 15 DCMR § 4301.

164 D.C. Code Title 8. Environmental and Animal Control and Protection. Chapter 17R. Energy Efficiency Financing, § 8–1778.01, Definitions.

Regulatory commissions have become involved in promoting energy efficiency in a number of ways. In the case of states with regulated, vertically integrated utilities, commissions may require that energy supply plans include consideration of "demand-side resources" like energy efficiency. Many contend that it is cheaper for utilities to meet projected demand with "megawatts" instead of megawatts; that is, providing incentives for usage reduction can be less costly than new generation. In restructured jurisdictions like the District of Columbia, regulatory commissions no longer exercise authority over utilities' generation investment plans.

Many restructured jurisdictions adopted new types of distribution-system charges on ratepayers to ensure that funding for energy efficiency would continue. In the District of Columbia, the Sustainable Energy Trust Fund surcharge provides funding for energy efficiency programs administered by the Department of Energy and the Environment through the Sustainable Energy Utility ("DC SEU"). The DC SEU provides financial support for residents to implement energy efficiency measures in their homes and businesses.

The NARUC Manual observes that:

> This Manual includes EE as resource, even though some may not. However, EE programs do effectively shift or shave load, or both, which certainly can fit within the view of acting as a resource, especially if the load shift can be predicted or scheduled. Measurement and forecasting play a large part in EE. Attempting to determine what a load curve would look like absent EE adds a level of complexity to the issue of determining the resource value of the EE. A regulator will need to determine whether it is appropriate to include EE in its consideration of DER.[165]

Based on this information, Staff does not recommend the adoption of a definition for energy efficiency.

g. Microgrids

Microgrids are not discussed in the D.C. Code or in Commission regulations. Staff provides a detailed discussion of microgrids, as well as some of the opportunities and challenges that they present, in the next section of this Report. However, as it pertains to developing rules and adopting definitions for the types of DER that are pertinent to the District's modernization efforts, **Staff recommends that the Commission issue a NOPR to adopt a definition of microgrid. A draft NOPR containing Staff's proposed definition is attached to this Report at Appendix E.**

165 NARUC Manual at 50 (November 2016).

3. Recommended Action

RA

Issue Notices of Proposed Rulemaking to adopt definitions for the various types of Distributed Energy Resources that are pertinent to the District's grid modernization efforts.

Based on the preceding discussion, Staff recommends that DER, and each of the subcategories of DER pertinent to the District, be defined in the Commission's rules, if they are not already adequately defined. Specifically, the Commission should adopt definitions for: (1) distributed energy resource, (2) distributed generation ("DG"), (3) fossil fuel generators, (4) cogeneration systems, (5) fuel cells, (6) microturbines, (7) NEM facilities, (8) back-up generators, (9) energy storage, (10) batteries, (11) electric vehicles, (12) fly wheels, (13) demand response, and (14) microgrids.

Therefore, Staff has drafted a Notice of Proposed Rulemaking ("NOPR") containing definitions for each of these terms attached as Appendix E to this Report. The public may file comments on the draft NOPR definitions in conjunction with any comments filed on the entirety of this Staff Report.

Staff believes that adopting definitions for these terms will help remove some regulatory barriers to modernization efforts in the future, introduce some regulatory certainty, and provide Stakeholders an opportunity to inform the Commission before regulations are finalized. Once the rules related to these DER categories are finalized, Staff recommends that the Commission update other related rules that may be impacted by these new definitions, like the Commission's interconnection rules.

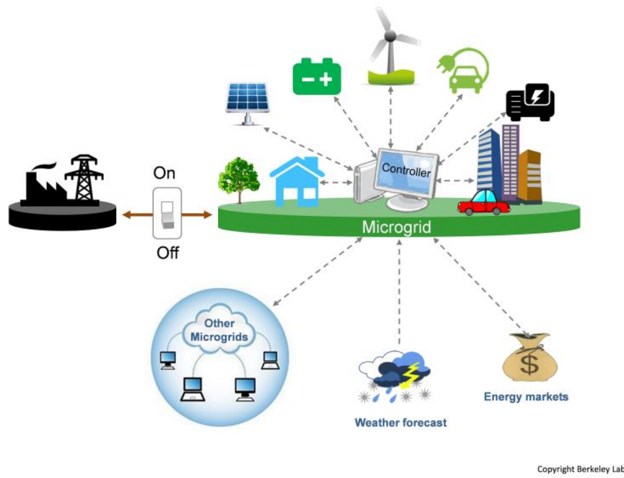
C. Microgrids in the District

Generally, a microgrid is a combination of generation and load within a defined electrical boundary that is able to disconnect from the larger distribution system and "island" itself to continue providing electricity to its load when there is a disruption on the larger distribution system. This unique ability to go into "island" mode is derived from a disconnection switch that is a sophisticated mechanism that allows the microgrid to separate from and to rejoin the larger distribution system without interruption.[166] Absent these features, a true microgrid does not exist, what exists instead is an electric distribution system with affiliated generation.

Once islanded, the microgrid requires a control system, possibly including energy storage, to balance the generation and loads within its electrical boundaries to ensure the stability of the system. Both the disconnection switch and microgrid control system represent additional costs of microgrid service which must be recovered either from the load served or another source.

[166] In a building with backup generation, there is typically a pause before the generator picks up the load.

Additionally, "[m]icrogrids help with the integration of growing deployments of renewable sources of energy such as solar and wind and other DER such as cogeneration, energy storage, and [demand response]. By using local sources of energy to serve local loads, there is a reduction of energy losses in transmission and distribution, which further increase efficiency of the grid."[167] The avoidance of losses is a function of local generation, not the microgrid functionality.



As was discussed earlier, the Commission is responsible for insuring that charges made for electricity and natural gas are "just, reasonable, and nondiscriminatory."[168] Additionally, the Commission, for public health and safety purposes, has clear authority over the placement of any "wires, pipes, conduits, ducts, or other fixtures in, over, or under the streets, highways, and public places, in the District" related to the provision of natural gas or electricity.[169] The Commission also has the duty to ensure that services provided are reliable and safe as well as to protect residential consumers' rights. The Commission's responsibility to regulate these matters applies broadly, not just to customers of Pepco and Washington Gas.

As to how microgrids fit within the Commission's mandates and the District's current statutory and regulatory framework, it is important to recognize that microgrids both generate and physically transport electricity within the microgrid boundary, which means that it provides a distribution service. Neither the generation nor distribution service is unique to a microgrid but the exact relationship of these services with their owner/operator(s) and the owner/operator's relationship to the load are important for classifying the microgrid within the regulatory structure and determining how the Commission's jurisdiction applies.

[167] NARUC Distributed Energy Resources Rate Design and Compensation Manual, at 48 (November 2016).

[168] D.C. Code § 1-204.93.

[169] D.C. Code § 34-301.

1. Types of Microgrids

In the industry, there are two types of microgrids widely recognized: (1) a campus-style microgrid; and (2) an area, community, or public-purpose microgrid.[170] A campus style microgrid serves assets within the perimeter of a discrete campus – *e.g.*, a university, corporate, or government campus, a prison, or a military base.[171] Campus microgrids generally do not cross public rights-of-way or incorporate public utility infrastructure.[172] An area, community, or public purpose microgrid serves a group of customers, likely with municipal or other public facilities as anchor tenants.[173] Area microgrids do typically cross public rights-of-way and incorporate public utility infrastructure.[174] Examples of an area, community, or public-purpose microgrid may include communication centers, police and fire stations, hospitals, waste water treatment plants, schools, emergency shelters, grocery stores, and gas stations.[175]

In assessing the regulatory implications of microgrids, the primary question is whether the microgrid constitutes an "electric company" under D.C. Code § 34-207, which is an entity ". . . physically transmitting or distributing electricity in the District of Columbia to retail electric customers." As discussed above, all microgrids involve the physical transmission of electricity from the generation to the load. Thus, the controlling question is whether the load in the microgrid constitutes "retail electric customers" such that the microgrid is classified as an electric company. As defined in D.C. Code § 34-1501 (12), a "customer" is "means a purchaser of electricity for end use in the District of Columbia." The use of the word retail in the definition of electric company serves to distinguish between retail (end use) and wholesale (sale for resale) customers.

A microgrid that itself is also the retail electric customer represents the simplest configuration of a microgrid. One example is a campus-style microgrid, where a single entity, like a university, owns and operates every component of the microgrid and internalizes all costs associated with the microgrid (*e.g.*, Princeton University in New Jersey). In this arrangement, the university, or microgrid operator, would not be an electric company, utility, or electricity supplier,[176] but

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170 There is also a third type of microgrid configuration – a hybrid microgrid. Hybrid microgrids can contain a combination of various components of both campus and area microgrids and raise similar functionality issues as those discussed in this section.

171 Matt Grimley and John Farrell, *Mighty Microgrids*, Institute for Self-Reliance, Energy Democracy Initiative Report (March 2016); *see also*, Microgrid Institute, *About Microgrids* (2014).

172 Microgrid Institute, *About Microgrids* (2014).

173 Matt Grimley and John Farrell, *Mighty Microgrids*, Institute for Self-Reliance, Energy Democracy Initiative Report (March 2016); *see also*, Microgrid Institute, *About Microgrids* (2014).

174 Microgrid Institute, *About Microgrids* (2014).

175 Microgrid Knowledge, *Community Microgrids, A Guide for Mayors and City Leaders Seeking Clean, Reliable and Locally Controlled Energy* (2015).

176 This phrase is used from multiple times in the D.C. Code to provide exemptions from the definitions of "Electrical Company," D.C. Code §34-207; "Gas Company," D.C. Code §34-209; "Electricity Supplier," D.C. Code §34-1431 (6)(A), D.C. Code §34-1501 (17)(A), "Natural Gas Supplier," D.C. Code §34-1671.02 (12).

instead it is a utility "customer" because the microgrid operator purchases electricity from the utility (Pepco) "for end use in the District of Columbia."[177]

On the other hand, if the microgrid generates electricity and provides distribution services to retail electric customers (e.g. end users), then it is an "electrical company" under the D.C. Code.[178] The classification of an area microgrid as an electrical company raises important issues related to the functionality of microgrids.

First, as an electrical company, the microgrid would have to seek approval from the Commission regarding whether the rates being charged to customers are just and reasonable, among other things. Also, it could not generate electricity for resale or otherwise "engage in the business of an electricity supplier in the District of Columbia except through an affiliate."[179] This does not mean, however, that the distribution and generation operations of the microgrid could not be set up under common, overall ownership. It would simply mean that there would be an electric company operating the microgrid's distribution system and an electric supplier operating and selling the microgrid's generation all under the umbrella of a parent company.

The second issue is that if the microgrid were an electric company, the microgrid would be subject to a host of regulations applicable to electric companies and it would be required to operate its distribution system in an open manner. Specifically, D.C. Code § 34-1513 (a)(1) requires electrical companies to:

> provide distribution services to all customers and electricity suppliers on rates, terms of access, and conditions that are comparable to the electric company's own use of its distribution system. The electric company shall not operate its distribution system in a manner that favors the electricity supply of the electric company's affiliates.[180]

These restrictions tie into the fact that the District's customer choice mandate provides "customers" with certain rights that would prevent a public purpose microgrid from restricting the customer's ability to purchase electricity to only the microgrid. Specifically, "regardless of customer class,"[181] electricity suppliers and consumers have the right to:

> use and interconnect with the electric distribution system on a nondiscriminatory basis in order to distribute electricity from any electric supplier to any customer. Under this right, consumers

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177 D.C. Code § 34-1501 (12).

178 *See* D.C. Code § 34-1501 (12).

179 D.C. Code § 34-1513 (a).

180 D.C. Code § 34-1506 (a)(1).

181 D.C. Code § 34-1502 (b)(1).

shall have the opportunity to purchase electricity supply from their choice of licensed electricity suppliers.[182]

Retail choice allows customers of an electric utility to purchase the generation and transmission components of their electrical service from competitive energy providers, meaning that any customers within an area microgrid would have the right to choose the service provider of the generation and transmission components of their electrical service when the microgrid is not islanded.[183] The requirement to provide retail choice could eliminate one of the primary business benefits to being a microgrid operator in the first place, namely having "captive" customers within the boundary of the microgrid. Instead of being bound by the prices charged by the microgrid operator, the customers within an area microgrid would likely purchase electricity generated at prices competitive with those offered by the SOS provider or other electricity suppliers.

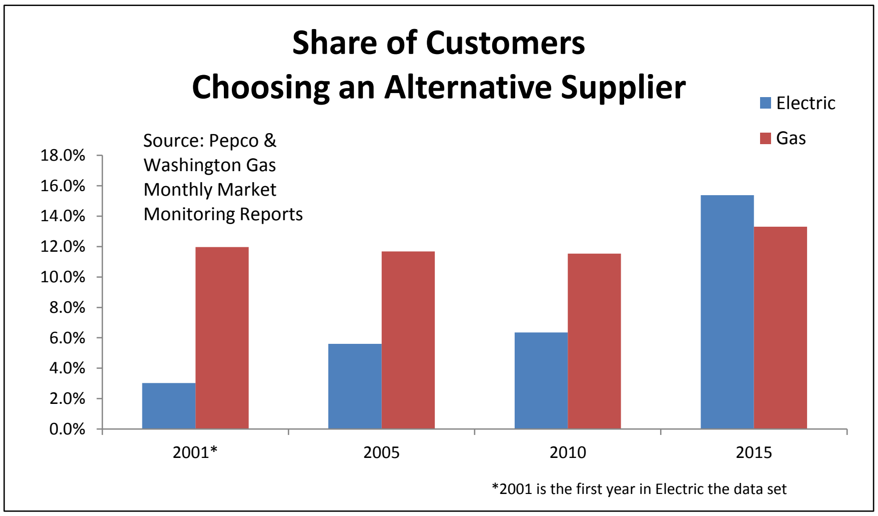

FIGURE 4: SHARE OF CUSTOMERS CHOOSING AN AES

Along with the issues already discussed as it relates to area microgrids with multiple customers, the Commission would need to ensure that microgrid operators meet the Commission's safety and reliability standards,[184] comply with RPS requirements,[185] report fuel mix and emissions,[186] and incorporate the microgrid into the Commission's – and OPC's – assessment process. Furthermore, since an area microgrid operator would be considered to be an electric company, the Commission would have jurisdiction over any consumer complaints stemming from the

182 D.C. Code § 34-1501 (14).

183 Whether this right would persist when the microgrid is islanded is an interesting question. Under the BGE Microgrid proposal submitted in Maryland, islanded customers would pay the SOS rate; BGE proposed that the entire project be paid for by a surcharge recovered from all BGE customers.

184 D.C. Code § 34-401 (a).

185 D.C. Code § 34-1432.

186 D.C. Code § 34-1504 (2).

operation of the microgrid, including billing disputes. Therefore, the applicability of Commission's Consumer Bill of Rights ("CBOR") rules would also have to be considered.

2. Potential Microgrid Benefits

Serving Nearby Neighborhoods. Some proponents of microgrids claim that a microgrid could provide power to neighboring residents during a wider power outage. For example, during Hurricane Sandy, the microgrid at Princeton University, which "operates synchronized (connected) with the local utility," kept the university running when much of New Jersey had no power.[187] Additionally, Princeton was able to assist local residents whose homes remained dark during and after the storm by inviting them to "warm up, recharge phones and other electronic devices and use wireless internet service at the hospitality center on campus." The University "also offered a heavy duty electricity generator for use by Princeton municipal authorities if necessary."[188] However, for a campus microgrid like Princeton's to distribute electricity to nearby neighborhoods the electrical boundary and associated control system of the microgrid would have to be extended to the neighborhoods in question; that is, those nearby residents must be incorporated into the microgrid. If that were to occur, then the campus microgrid boundary would cross public rights-of-way to provide electricity to nearby customers – making it an area microgrid subject to regulations applicable to electric companies. Furthermore, the additional expense of incorporating a microgrid in such a manner would have to be paid for either solely by the residents that benefit (through the creation of a separate distribution service rate class), recovered from all of the customers on the distribution system, or subsidized by taxpayers.

Energy Storage and Microgrids. In order to support control operations during islanding, microgrid designs frequently incorporate energy storage components. An added bonus comes when the energy storage can be used when the microgrid is in non-islanded mode to sell ancillary services to the transmission system. However, the storage capacity required to provide such ancillary services is likely to be larger than what is required to support islanding of the microgrid.

Environmental Benefits. A microgrid typically has, at its core, a combined heat and power system ("CHP"). CHP runs on natural gas but also makes use of what is otherwise waste heat, raising the energy efficiency of the CHP system to a very high level. It is this efficiency in exploiting the energy content of the natural gas that makes it a benefit to the environment; more power, heating, and cooling can be produced with fewer emissions. However, the environmental benefits of CHP can be had without the added expense of microgrid functionality.[189]

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[187] Consulting-Specifying Engineer, *Case Study: Microgrid at Princeton University*, by Paul Barter and Edward Borer, accessed June 8, 2015. http://www.csemag.com/single-article/case-study-microgrid-at-princeton-university/a852c6c36420f738c8ecf66de7aa3dd1.html

[188] Princeton University, "University assists first responders, area residents after Hurricane Sandy" by Office of Communications. https://www.princeton.edu/main/news/archive/S35/23/41C55/index.xml?section=topstories

[189] The 2013 Walter Reed Utility Infrastructure Guide: Roadmap to a Sustainable Future provides many details of the "tri-generation" CHP project proposed for the Walter Reed site but contains no mention of "microgrid."

3. Microgrid Concerns

As discussed above, several issues arise when residential and/or commercial customers are served by a micro grid, including: What Commission rules must the microgrid operator comply with? What safety and design standards are the microgrid operators required to adhere to? How should the costs related to microgrid functionalities be recovered?

An important threshold question is whether a microgrid operator must to apply for the Commission's permission to build electric distribution facilities.[190] Any microgrid distribution system under 69,000 volts would fall below the size threshold for Smaller Scale Construction. Therefore, operators of such microgrids would not be required to file a certificate of public convenience and necessity ("CPCN") for the microgrid's *electric distribution facilities*.[191] An area microgrid which has customers, however, would be required to file for CPCN for its *generation facilities* because the facility generates electricity for sale to customers.

Another question that must be answered is whether the microgrid's electric distribution facilities are behind the customer's meter ("BTM") or in front of the retail customer's meter? In the case of BTM facilities, like campus-style microgrids (*e.g.*, Princeton University), the microgrid's electric distribution facilities distribute electricity to electricity users who do not pay for their electricity directly because it is included in the university's budget. If residents and businesses inside the microgrid boundary pay for utilities through their rent, then these users are in a position similar to master metered apartment ("MMA") residents.[192] As discussed above, the CBOR would not apply to these types of BTM facilities because the residents would not fit the definition of "customer."[193] However, the Commission's submetering rules may apply to

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190 15 DCMR § 2100.1. Provisions for Construction of Electric Generating Facilities and Transmission Lines. This Chapter shall govern the construction of electric generating facilities, overhead transmission lines designed to carry sixty-nine thousand (69,000) volts or more, underground transmission lines in excess of sixty-nine thousand (69,000) volts as well as any substations connected to such lines. Authority: D.C. Code, 2001 Ed. §§ 34 - 301, 34 - 302, and 34 -1516.

191 15 DCMR § 2199.1. When used in this chapter, the following terms and phrases shall have the meaning ascribed: Smaller-Scale Construction - any construction project which involves providing electricity to a customer for which a Certificate of Public Convenience and Necessity is not required pursuant to this chapter. 15 DCMR § 2110 Annual Report on Smaller Scale Construction 2110.1. Electric corporations operating in the District of Columbia shall submit an annual report, on or before February 15th of each calendar year, which summarizes smaller-scale construction and the costs associated with each project undertaken by the corporation during the preceding year. SOURCE: Final Rulemaking published at 40 DCR 8359, 8366 (December 3, 1993); as amended by Final Rulemaking published at 51 DCR 8653 (September 3, 2004).

192 15 DCMR § 1899.1. When used in this chapter, the following terms and phrases shall have the meaning ascribed: Commercial Customer - a non-residential customer of a utility. Non-residential customers shall include electric customers served from the master-metered apartment tariff.

193 15 DCMR § 399.1. When used in this chapter, the following terms and phrases shall have the meaning ascribed: Customer: an accountholder or purchaser of electric, natural gas or Telecommunications services for residential use in the District of Columbia, excluding master-metered apartments with four or more units. An Account holder is a person in whose name an account with a Utility, Energy Supplier, or Telecommunications Service Provider has been established.

commercial customers.[194] Submetering in the District has not been extended to residential customers.

Pursuant to D.C. Code § 34-301, the Commission has jurisdiction to regulate utilities to maintain public health and safety.[195] In the case of in front of the meter facilities, the CBOR and the Commission's EQSS rules should apply, whether owned by Pepco or another entity. However, BTM facilities are not required to adhere to the Commission's safety and reliability regulations. Therefore, the question becomes, in the absence of Commission regulation over the design and safety of these BTM facilities, which design and safety standards for electric distribution facilities should apply to these facilities — the National Electrical Safety Code ("NESC")[196] or the National Electrical Code ("NEC")?[197]

Another key point of consideration regarding the functionality of different types of microgrids is cost recovery.[198] In other words, how will the microgrid operator recover costs for investments, like the sophisticated control system needed to operate a microgrid if the users are retail customers? Arguably, in the case of a campus microgrid, a private institution like a university or industrial facility, which is not an electrical company under the D.C. Code, could recover the microgrid costs through the institution's operating budget. Similarly, even where a campus microgrid serves a mixed-use development, the costs could be recovered from residents and businesses through their rent or home owner's association fees. However, where residents and businesses within the microgrid boundary are either classified as customers under the D.C. Code or treated as customers by the microgrid operator in the sense that each are metered for their electricity and required to pay energy charges on a per-kWh basis, then the additional microgrid

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[194] 15 DCMR § 4401.3. The owner shall not engage in submetering or energy allocation with a tenant without first securing from that tenant, a written agreement for the purchase of electricity or natural gas. The agreement, which may be part of the tenant's lease agreement, shall be executed before any electricity or natural gas is delivered. The owner, upon establishing a submetering or energy allocation practice, agrees to supply any and all tenants with electricity or natural gas and shall be bound by such terms and conditions in acting upon agreements for electric service or natural gas service.

[195] Commission shall, within its jurisdiction: "reasonably promote the public interest, preserve the public health, and protect those using such gas or electricity." D.C. Code § 34-301.

[196] Utilities, their employees, contractors and manufacturers — as well as telephone companies, cable TV providers, railways and other organizations in the exercise of functioning as a utility — look to the NESC for practical safeguarding guidelines. IEEE's National Electrical Safety Code (NESC) is also known as American National Standard C2. It is a consensus standard that has been prepared by the National Electrical Safety Code Committee under procedures approved by the American National Standards Institute (ANSI). The membership of the NESC Committee is composed of national organizations and is certified by ANSI as having an appropriate balance of the interests of members of the public, utility workers, regulatory agencies, and the various types of private and public utilities. Utility regulators in the US and more than 100 nations use the Code at least in part. https://standards.ieee.org/about/nesc/nesc_2017_brochure.pdf.

[197] The DCRA likely requires adherence to the NEC by anyone applying for a building permit that involves electrical work behind the meter.

[198] Under current law, the provider of electric distribution service must apply to the Commission to increase rates; logically, then, any provider of electric distribution service to residential customers would need to apply to the Commission to establish or increase the rates charged for that service. *See* D.C. Code § 34-901.

costs of the disconnection switch and microgrid control system would need to be recovered as part of the microgrid's distribution rates. Additionally, the Commission would need to consider how any bills to retail customers served by a microgrid would reflect Pepco's distribution costs as they relate to serving the microgrid as well as other broadly applicable social charges such as the District's Right of Way Fee, SETF Surcharge, EATF Surcharge, and RAD Surcharge.

D. Interconnection Rules & Notice of Construction Procedures

1. Existing Legal & Regulatory Framework

15 DCMR Chapter 40 establishes the District of Columbia Small Generator Interconnection ("DCSGIR") rules which, pursuant to 15 DCMR 4000.1, apply to facilities satisfying the following criteria: "(a) The total nameplate capacity of the small generator facility is equal to or less than 10 megawatts (MW); (b) The small generator facility is not subject to the interconnection requirements of PJM Interconnection; and (c) The small generator facility is designed to operate in parallel with the electric distribution system." The DCSGIR set forth the procedures and standards for customers with on-site generation to interconnect with Pepco's electric distribution system. Currently, there are no standard interconnection procedures for connecting microgrids or energy storage systems to the larger electric distribution grid in the District.[199] However, the certification of interconnection equipment under 15 DCMR § 4002 requires compliance with IEEE 1547 standards.[200]

It must be pointed out that on July 25, 2016, the District Council passed the Renewable Portfolio Standard Expansion Amendment Act of 2016 ("RPS Act of 2016").[201] The RPS Act of 2016 increased the capacity for customer-generator facilities eligible to engage in RPS, from 10 MW to 15 MW.

The Commission also has an open proceeding, Formal Case No. 1050, which is an investigation of the implementation of interconnection standards in the District of Columbia. In the context of Formal Case No. 1050, the Commission reviews Pepco's Annual Interconnection Report, assesses the effectiveness of the implementation process, and has directed Pepco to take steps to improve the application process.[202] In order to address concerns about Pepco's interconnection process and the barriers it presents to customers, the Commission held a legislative-style hearing on July 21, 2015.[203] Since that hearing, efforts have been made by Pepco and the Commission to

199 WGL Energy's Comments to Order 18144 at 14.

200 WGL Energy's Comments to Order 18144 at 14.

201 B21-0650 Renewable Portfolio Standard Expansion Amendment Act of 2016 ("RPS Act of 2016"), was enacted July 25, 2016. *See D.C. Act A21-0466.* The RPS Expansion Amendment Act of 2016 became effective October 8, 2016. *See D.C. Law L21-0154.*

202 *Formal Case No. 1050, In the Matter of the Investigation of Implementation of Interconnection Standards in the District of Columbia* ("*Formal Case No. 1050*"), Order No. 14017, rel. July 31, 2006 ("Order No. 14017").

203 *Formal Case No. 1050*; Transcript of Legislative-style Hearing held on July 21, 2015; July 24, 2015.

improve the interconnection process. For example, by Order No. 18113, issued February 29, 2016, the Commission directed Pepco to begin including a list of names, locations, fuel type, and kW capacities of Level 2, Level 3, and Level 4 facilities approved during the reporting year in its Annual Interconnection Report.[204] The Commission also issued Order No. 18269, on July 14, 2016, which granted Pepco's request to remove the $100 application fee for Level 1 interconnection applicants.[205] Furthermore, on October 17, 2016, the Commission issued Order No. 18575, which contained directives for Pepco to take certain steps to improve the implementation of interconnection in the District, including, among other directives:

(1) direction for Pepco to modify the "Requested Work" label on its website to be more user-friendly,
(2) report response time to customer calls beginning with the 2016 Annual Report,
(3) direction to provide quarterly reports with information on the number of applications that missed approval deadlines,
(4) direction to include a remedial plan for missed deadlines in its quarterly report,
(5) provide an incomplete application report each quarter, and
(6) direction for Pepco to provide specific data for currently interconnected solar and non-solar facilities to facilitate our internal monitoring of small generation facilities.[206]

Additionally, improving interconnection measures by Pepco was a merger commitment in Formal Case No. 1119.[207] On June 21, 2016, Pepco filed an "Interconnection of Distributed Energy Resources" report in order to address DER-related commitments resulting from the Commission's approval of the PHI's merger with Exelon. In that report, among other things, PHI discusses its interconnection application review and approval process as well as improvements being adopted to help facilitate the interconnection of proposed renewable-energy projects to Pepco's distribution system. In the report, PHI recognized the growing number of interconnection applications being filed with Pepco and "the increasing need to streamline the interconnection application review process to minimize delays, decrease operating issues, and improve the overall customer interconnection experience." PHI noted its efforts to streamline the process includes: "a new online application website," "a new application fee process, increased internal cross-jurisdiction facilitation and coordination, and reduction in processing time down to one business day for customer class, voicemail returns, and Green Power Connection Mailbox messages."

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204 *Formal Case No. 1050*, Order No. 18113, ¶ 35, rel. February 29, 2016 "Order No. 18113").

205 *Formal Case No. 1119, Formal Case No. 1050,* Pepco's Request to Eliminate the Level 1 Small Generation Interconnection Fee ("Pepco's Request"), filed June 17, 2016; Order No. 18269, rel. July 17, 2016 ("Order No. 18269"). Pepco made its request pursuant to Order No. 18148.

206 *Formal Case No. 1050,* Order No. 18575, rel. October 17, 2016 ("Order No. 18575"). The Commission provided a host of directives for Pepco to improve its interconnection process in ¶¶42-47 of the Order.

207 *See Formal Case No. 1119*, Order No. 18148, rel. March 23, 2016, Attachment B, at 25-28 ("Order No. 18148").

PHI also notes increased customer education and outreach measures to educate customers on the interconnection process as well as the implementation of expedited technical review of interconnection applications ("Fast Track Process") that meet certain criteria. PHI notes the development of an electrical data interchange ("EDI") tool that went live in April 2016 to allow "customers and customer representatives to access historical electric usage." Several of these identified improvements relate to proposed requirements by stakeholders in this proceeding. The Commission should consider whether these changes in the interconnection process go far enough to facilitate DER deployment or whether additional regulations are needed.

The Interconnection Report also identifies challenges to incorporating behind-the-meter solar and energy storage, such as potential system impacts on the grid, inappropriate net-metering standards, concern regarding accounting for Renewable Energy Certificates ("RECs"), lack of communication between the customer system and utility that may lead to negative impact on the macrogrid, as well as procedural and administrative challenges which Staff will discuss in more detail.

In a December 22, 2106 newsletter, DC SUN provided an early review of Pepco's new online portal that supports Net Energy Metering ("NEM") interconnections, Green Power Connection.[208] DC SUN indicates that the new portal allows customers to electronically request that Pepco send suppliers 24 months of historical data so that the solar installer can properly size a solar system for the customer's usage. DC SUN reports that "this tool functions well and can serve as a great way for potential solar customers to share their utility usage with installers" and "provides a more streamlined solution for managing the interconnection process and is a major step forward for Pepco."[209] DC SUN further notes that "[t]his tool shows a significant improvement in the interconnection process over the past few years."[210]

2. Legal & Regulatory Challenges

Several stakeholders, including the District Government, Pennoni, WGL Energy, MDV-SEIA, and GSA submitted comments asserting that a key component to facilitating DER development in the District is the creation of streamlined interconnection rules. More specifically, MDV-SEIA asserts that the process for interconnection approvals must be improved as currently there are too many uncertainties placed on project developers by long and inconsistent timelines. In order to facilitate DG, MDVA-SEIA asserts the "Commission should focus on eliminating ambiguities in the application process, making information on potential technical obstacles

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208 DC Solar United Neighborhoods, Online Portal Streamlines Solar Interconnection Process, December 22, 2016, http://www.dcsun.org/2016/12/22/online-portal-streamlines-solar-interconnection-process/ , accessed January 11, 2017.

209 DC Solar United Neighborhoods, Online Portal Streamlines Solar Interconnection Process, December 22, 2016, http://www.dcsun.org/2016/12/22/online-portal-streamlines-solar-interconnection-process/, accessed January 11, 2017.

210 DC Solar United Neighborhoods, Online Portal Streamlines Solar Interconnection Process, December 22, 2016, http://www.dcsun.org/2016/12/22/online-portal-streamlines-solar-interconnection-process/, accessed January 11, 2017.

readily available to developers early in the project development cycle," including a clear statement of the criteria for interconnection approval and publishing the capacity available for additional interconnections on individual circuits.[211] Grid2.0 asserts that the Commission should allow for any DER that complies with existing rules and regulations, adding that in "instances where there is a dispute on the effect of DG to the grid, there should be provisions for the owner/operator of the DG to either contest any utility objection, or install necessary technology to manage the DG in a manner consistent with best practices."

In addition, stakeholders suggest expedited permitting processes for Qualified DER systems and solar energy developers to decrease costs associated with project development.[212] Pennoni recognized that microgrids facilities fall into different categories and suggested a "tiered approval process based on the distributed generation facility's: (1) technology type; (2) generating capacity; (3) physical location; and (4) industry peer review certification."[213] Pennoni asserts that taking a tiered approach will help the Commission facilitate DER deployment by "laying out precisely how different types of [DG] will be approved under D.C. Code § 34-1516" and lessening "the administrative burden of seeking approval by pre-qualifying certain types of" DG.[214] Pennoni also suggests that the Commission could adopt a four tier process and that to comply with the notice and hearing requirements of D.C. Code § 34-1516, the tiers could be adopted through a notice and hearing.[215]

GSA suggests that the Commission establish a "streamlined and pro-forma approval process" in order to facilitate review and approval of DG Facilities with many of the requirements being maintained or implemented by the Commission.[216] WGL Energy suggests the creation of enforcement provisions related to interconnection regulations to hold the utility accountable.

Stakeholders further suggest that the Commission: (1) adopt interconnection procedures that "require the electric utility to interconnect competitive microgrid facilities to the distribution grid in the same manner that distributed generation ("DG") is now being interconnected but with enforceable timelines, like missed deadline penalties; (2) adapt Pepco's interconnection tariff standards to wide-spread distributed generation deployment and microgrids in the District; (3) require Pepco to interconnect microgrids in the District that have a capacity up to 20 MW; (4) direct Pepco to provide stakeholders with information regarding the benefits/harms/costs of distributed generation and microgrids to the larger distribution grid related to a customer's choice of self-consumption or sales to the grid; and (5) require non-discriminatory access to the

211 MDV-SEIA Comments to Order 18144 at 2.

212 DOEE/DCG Comments to Order 18144 at 6-7.

213 Pennoni Comments to Order 18144 at 4.

214 Pennoni Comments to Order 18144 at 4.

215 Pennoni Comments to Order 18144 at 4.

216 GSA Comments to Order 18144 as 3. In its filing GSA provides a bulleted list of considerations for the streamlined approval process, including: identifying key criteria, acceptable sources of power, necessary zoning approvals, required reliability studies, required interconnection agreements, etc.

distribution system – require electric company to open all interconnection requests to third party bids." WGL also suggests requiring Pepco to provide microgrids acting as, or coordinating with competitive suppliers with wheeling services, project developers can provide competitive services to District residences and businesses.[217]

Also, as WGL Energy mentions in its comments, when the Commission approved the merger of PHI Companies with Exelon Corporation the Commission accepted Pepco's commitment to implement specific enhancements to the present interconnection process for behind-the-meter, small distributed generation in the District.[218] The enhancements include making available to project developer service territory maps uploaded on PHI's website and updated periodically, system size restrictions, secondary network circuits, and other valuable information needed to support interconnection requests under 15 DCMR Chapter 4000.[219] Also, the enhancements include planning for distributed generation penetration, evaluating the long term effects and benefits of distributed generation on grid reliability and efficiency, providing a transparent process for reviewing and approving applications to interconnect distributed generation projects, providing maps showing the location and size of circuit constraints, providing access to customer usage data, maintaining a list of accepted inverter equipment, committing to maintain existing interconnections within twenty business days after an applicant submits a certificate of completion and an inspection certificate, and eliminating the current $100 application fee for Level One applications. Finally, Pepco committed to establish behind-the-meter generation and battery information protocols and to establish an enhanced communication plan to promote behind-the-meter generation with input from stakeholders.[220]

As WGL Energy noted in its MEDSIS Workshop comments, there are no standard interconnection procedures for connecting microgrids or energy storage systems to the larger electric distribution grid in the District.[221] Both microgrids and energy storage facilities present unique qualities, which distinguish them from small capacity generators. As was stated elsewhere, microgrids have all three elements: generation, transmission and distribution. Because they have generation, one of the concerns with microgrids is the potential for them to feed energy back to the macrogrid and possibly affect reliability for standard customers of the electric distribution company ("EDC"). Section 4002 of the DCSGIR contains requirements for inverters to protect against the negative impact of two-way power flow between the small capacity generator and the distribution system.

Energy storage facilities present a different challenge. Although they do not possess the elements of transmission and distribution like microgrids, there is a possibility that storage facilities suddenly may feed a surge of their stored energy to a portion of the EDC's network and

217 WGL Energy's Comments to Order 18144 at 16.

218 WGL Energy's Comment to Order 18144 at 14.

219 *See Formal Case No. 1119*, Order No. 18148, Attachment B, at 25-28.

220 *See Formal Case No. 1119*, Order No. 18148, Attachment B, at 25-28.

221 WGL Energy's Comments to Order 18144 at 14.

threaten reliability. Based on this concern, it seems that energy storage may affect the distribution system in a similar fashion as a generating facility. Similar to Microgrids, Section 4002, pertaining to inverters, should be amended to address energy storage facilities as well, depending on their capacity, energy storage facilities may fall under any of the four levels of review in Chapter 40 of DCSGIR. However, because energy storage has some of the properties of generating facilities but are not generating facilities, they may warrant their own section of review.

Another issue that must be considered is whether the Commission should require Pepco to provide wheeling services to microgrids now or the near future. As discussed in the microgrids section of this Report, it is currently unclear how microgrids will be configured in the District. Microgrids must first be defined and it must be determined whether microgrids will be permitted to net export. If they are allowed to net export, then the issue becomes whether they should be designated as competitive retail suppliers. If they are treated as competitive retail suppliers, then the discussion of retail wheeling services must also be addressed. In the absences of such determinations, it is premature for the Commission to make a determination on the feasibility of Pepco providing retail wheeling services to microgrids.

As mentioned above, on October 17, 2016, the Commission issued Order No. 18575 in Formal Case No. 1050, wherein the Commission continues to address the barriers for customers to engage in interconnection.[222] In that Order, the Commission stated that Pepco has recently implemented an online interconnection application process, pursuant to Attachment B of Order No. 18160, approving the merger.[223] The automated process contains the prompts that will facilitate completion of the application, will hopefully remove the processing delays commenters have experienced, and allow for the applicants to provide the necessary information to ensure their application are processed expeditiously.

In addition, Order No. 18575 noted that another source of delay that may have affect system operators is the delayed receipt of authorizations to operate ("ATOs").[224] ATOs are issued by Pepco after a small generating facility has been certified but before the operator has approval to operate on the Pepco's distribution system. There is no regulatory timeline for the issuance of an ATO. Delays may range from 33 to 139 days from the time Pepco receives the system operator's certificate of completion to the time Pepco issues the ATO.[225] Pepco asserts that in the fourth quarter of 2015, with the implementation of the new process and system, the Company processed 99 percent of ATO letters within 20 business days.[226] In addition, in Attachment B to Order No. 18160, which approved the merger, the Joint Applicants committed to issuing ATOs within 20 business days. They also commit to maintain statistics on their progress in this regard

222 *Formal Case No. 1050*, Order No. 18575, rel. October 17, 2016 (Order No. 18575").

223 *Formal Case No. 1119*, Order No. 18148, Attachment B, ¶ 125.

224 *Formal Case No. 1050*, Order No. 18575, ¶ 8, rel. October 17, 2016.

225 *Formal Case No. 1050*, Testimony of Solar Solutions (Greiterman), Tr. at 70.

226 *Formal Case No. 1050*, Pepco's Interconnection Annual Report for 2015 at 8.

and to report their statistics annually, and commit to implement or state what remedial action they took if their ATOs fall below 90% within the 20-day business day window.[227]

Finally, pursuant to Order No. 18160, the Joint Applicants filed a Petition for a rulemaking to amend certain provisions of Chapter 40 of the DCSGIR.[228] Among the proposed amendments to Chapter 40, is a modification to Subsection 4004.3, which would define the term "ATO" and make the 20-business day deadline for ATOs a requirement in the Commission rules.[229]

3. Recommended Actions

Staff is aware that measures are being taken in the Formal Case No. 1050 docket to address interconnection issues. Therefore, Staff refrains from making additional interconnection related recommendations in this Report. However, Staff believes that there are points of consideration that should be highlighted as Formal Case No. 1050 proceeds. Specifically, in addition to the interconnection measures currently being considered and implemented by the Commission, the Commission should consider interconnection procedures for distributed generation ("DG"), energy storage systems and microgrids within the context of the existing Formal Case No. 1050 docket.

Specifically, the Commission should consider streamlining the rules and procedures for interconnecting DERs, including revising 15 DCMR § 4002 to allow smart inverter deployment or to add islanding standards for distribution generation.[230] Also, Section 4002 may need to be amended to ensure that the proper inverters are required so the electric distribution system is not compromised. The Commission may also consider the following questions as it streamlines its interconnection procedures:

- If the Pepco's measures are not effective and the interconnection application delays persist, should the Commission impose deadline and penalty provisions?
- What penalty would be reasonable given that Pepco's conduct does not rise to the level of failing to provide safe, reliable service?
- Consider a Pepco feasibility report on expanding the Green Power Connection website, which mainly facilitates the interconnection of solar photovoltaic systems ("PV"), to support customer deployment of all types of Distributed Energy Resources ("DER").

Furthermore, Sections 4003 of Title 15 of the DCMR sets forth a tiered system, Levels 1 through 4, for the review and evaluation of the small capacity generation facilities that seek to

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227 *Formal Case No. 1119*, Order No. 18148, Attachment B at ¶ 123.

228 *Formal Case No. 1119*, Pepco's Petition of Potomac Electric Power Company for the Commission to Initiate a Rulemaking Proceeding to Amend 15 DCMR §§ 4004, 4099, and 3602 ("Petition"), filed July 18, 2016.

229 *Formal Case No. 1119*, Petition at 1.

230 Solar inverters are one of the most important components of a solar energy system. Inverters are power electronic devices which convert the direct current produced by photovoltaic ("PV") panels into alternating current. Smart inverters have advanced functions that serve to ensure the stability and reliability of the grid.

interconnect with Pepco's distribution network.[231] Sections 4004-4007, establishes the levels of review for each tier based upon the capacity (size in kWs) and complexity of the generation facility with Level 4 (Section 4007) addressing the largest and most complex facilities.[232] In light of the discussion in this Report, Staff believes Section 4007 will need to be amended to address microgrids. One particular element that should be addressed in this provision is the operating requirements needed to support a microgrid's islanding capability.

In the alternative to amending Section 4007 to address microgrids, as suggested by Pennoni, it may be more appropriate, given the unique characteristics and technical requirements of microgrids, to create a separate tier level of microgrid-specific interconnection procedures. It is worth noting that IEEE is discussing and considering a set of new interconnection standards, which includes islanding, and such standards may be suited to the configurations and challenges microgrids will present to in the District.[233]

RA

Issue a Notice of Proposed Rulemaking to Adopt Streamlined Notice of Construction Rules for Renewables Generating Facility Approvals to within 20 days

Some stakeholders suggest that expedited permitting processes for Qualified DER systems and solar energy developers be implemented to decrease costs associated with project development.[234] Staff agrees that such processes should be expedited. As discussed above, Staff recommends that the Commission issue NOPRs to define the various types of DER pertinent to the District, which will subsequently be incorporated into the Commission's rules governing interconnection with Pepco's distribution system. However, that process will take some time because of the need to define the DER terms prior to streamlining the interconnection process.

However, Staff recommends that, on a more immediate note, the Commission take action to streamline its the notice of construction ("NOC") rules for renewable generating facilities that sell electricity. Within the bounds of the District's existing statute concerning the construction of new electricity generation in the District, the Commission has the ability to make regulatory changes to speed the approval of any requests for new construction of renewable distributed generators. As outlined above, the 1999 Act and the DC Code require that the Commission

231 15 DCMR §§ 4004-4007 (2009).

232 15 DCMR §§ 4004-4007 (2009).

233 IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems.

234 DOEE/DCG Comments at 6-7.

approve any proposed construction of generating facility that sells electricity at retail or wholesale if it is in the "public interest" after "notice and hearing."[235]

The Commission's rules implementing this section cover the construction of electric generating facilities and transmission lines.[236] These rules provide for compliance without firm deadlines and make no distinction between fossil fuel powered generation and renewable generation sources. The equal treatment of fossil fuel powered generation and renewable generation in the current rules may present a burden on renewable distributed generation applicants and work against the District Council's intent to increase sources of clean power generation in the District.

The Committee Report for that 1999 Act states that, the Commission should consider the following three factors when reviewing applications for the construction of renewable generating facilities:

(1) "whether the applicant has complied or will comply with all applicable zoning and environmental laws;"
(2) "if a proposed generation facility will be relatively small and unobtrusive to the surrounding community, and will increase system reliability, its construction is likely to be in the public interest;" and
(3) whether it "will run on clean sources of power," as the District Council wants "to encourage as much as possible, the construction of generating facilities that will produce 'clean' electricity. Thus, if a generating facility will operate on renewable sources of power, its construction is likely to be in the public interest."[237]

Therefore, Staff recommends that the Commission issue a NOPR amending the construction of electric generating facilities and transmission lines rules to speed the construction of renewable distributed generation. Specifically, Staff recommends that the Commission adopt the three factors laid out in the Committee Report on the 1999 Act and provide that, in the absence of a filed objection, applicants who meet those conditions will be approved by the Commission within twenty days of filing a completed application. Staff believes that adopting these changes is an appropriate use of light touch regulation and would be in line with District policies favoring renewable energy. Staff has attached a draft NOPR reflecting these recommended changes at Appendix F to this Report. The public may comment on the appropriateness of these proposed changes in conjunction with comments filed on the entirety of this Staff Report.

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[235] D.C. Code § 34-1516 (2001).

[236] 15 DCMR §§ 2100-2199 (2004).

[237] Council of the District of Columbia, on Consumer and Regulatory Affairs Committee Report on the Retail Electric Competition and Consumer Protection Act of 1999 (December 1999) at 90-91.

E. Utility Ownership of DER Generation

1. Existing Legal and Regulatory Framework

As discussed earlier, the 1999 Act introduced competition to the retail sale of electricity in the District. As part of introducing competition, the Act limited the ability of Pepco, as the electricity distribution company, to sell electricity and curtailed Generating Facilities located in the District.

The 1999 Act carved out two means through which "the electric company" is involved in selling electricity. The first is Standard Offer Service ("SOS"), the District's default electricity service, which Pepco manages with Commission and OPC oversight as the Commission appointed SOS Administrator.[238] Through SOS, Pepco sells electricity it procured through the SOS auction process directly to customers. The second is detailed in D.C. Code § 34-1513 (a), which provides: "Other than its provision of standard offer service, the electric company shall not engage in the business of an electricity supplier in the District of Columbia except through an affiliate." Further, the Pepco affiliate would need to register as an electricity supplier under D.C. Code § 34-1505.[239] Under this arrangement, Pepco does not sell electricity; it is an affiliate of Pepco that engages in sales. Therefore, reading these two provisions together Pepco, the regulated distribution company, may only sell electricity as the SOS Administrator.

Regarding electricity generation in the District, during the Act's passage, Pepco was required to divest itself of its generation plants, including its Benning Road and Buzzard Point Generating Facilities in the District.[240] The Act established a means for Pepco to sell to a third-party or transition these facilities to an affiliate as well as examining their decommissioning.[241] Further, the Act mandated that any new generation facility constructed in the District for the sale of electricity must be found by the Commission after notice and comment to be in the public interest.[242] As a result of the requirement that Pepco, as the electric company, maintain the District's electric distribution system (D.C. Code § 34-1506) and the prohibition against Pepco, as the electric company, engaging in the business of an electricity supplier, Pepco no longer owns generation facilities in the District for the purpose of selling electricity.

238 D.C. Code §34-1509 (2001).

239 D.C. Code §34-1513 (b) (2001).

240 *See Formal Case No. 945, In the Matter of the Investigation into Electric Service Market Competition and Regulatory Practices*, Order No. 11576, at 1-4, rel. December 30, 1999 ("Order No. 11576"). *See also*, D.C. Code §§34-1519 and 34-1520.

241 D.C. Code § 34-1519 (2001).

242 D.C. Code § 34-1516 (2001).

2. Legal & Regulatory Challenges

MRC notes Pepco's continued role in electricity distribution in its comments asserting that "current regulations also allow for a utility-microgrid partnership, in which the utility owns the wires within the microgrid, while a microgrid developer or customers retain ownership of the included generation."[243] Pepco also acknowledges such an arrangement and explains that:

> Both the electric company and third parties may own the generation portion of the microgrid, provided that, other than in its capacity as the SOS administrator, an electric company may not sell generation to retail customers except through an affiliate.[244]

However, with the proliferation of DER in the District an emerging issue is whether Pepco should be able to own generation sourced from DERs. While some commenters assert that Pepco should not be able to own generation, Pepco argues that it should. More specifically, Pepco states that it currently owns installed solar systems on two of its substations (Northeast Substation and Benning 230 kV Substation) and additional solar will be included in the new Waterfront Substation.[245] Pepco explains that these solar facilities are "NEM facilities and all generation [will be] used to reduce station service requirements."[246] Further, Pepco explains that these solar panels can also be used to support zoning requirements for a specific piece of utility property.[247]

3. Recommended Action

Some commenters have expressed concerns about Pepco's ownership of DER facilities and the potential interference that such ownership could have in the competitive market. Other commenters presume that the 1999 Act prevents Pepco from owning electricity generating facilities. However, it is Staff's opinion that the 1999 Act does not limit Pepco's ability to own generation; it only limits Pepco's ability to *sell* electricity produced by any generation source that it owns. As Pepco points out in its comments, it currently owns limited DER facilities, NEM solar facilities, to produce power to support the operation of its substations.[248] These facilities support Pepco's operation of the distribution system and the District's zoning requirements. As to Pepco's relationship with a microgrid, in its comments, the Company also clearly states that it may only own the generation through its role as the SOS Administrator or through an affiliate.

243 MRC Comments to Order 18144 at 5.

244 Pepco Comments at 18, citing D.C. Code §§ 34-1513 (a)(b) (2001).

245 Pepco's Comments to Order 18144 at 15. Staff notes that Pepco has mentioned potential ownership of solar generation from a large solar installation at the Waterfront station, but that has not yet materialized.

246 Pepco's Comments to Order 18144 at 15.

247 Pepco's Comments to Order 18144 at 15, citing 11 DCMR § 3400, et seq.

248 Pepco's Comments to Order 18144 at 18.

Therefore, there is no need for Commission action regarding Pepco's ownership of DER facilities so long as the electricity generated by such facilities is not sold but is instead used by Pepco to support the reliable operation of the distribution system.

RA

Issue a NOPR to adopt a definition of "Electrical Company" that clarifies that the term expressly excludes any person or entity distributing electricity from a behind-the-meter generator to a single retail customer behind the same meter.

On a related note, Commission Staff recommends that the Commission clarify that the definition of "Electrical Company" found in D.C. Code § 34-207, shall be interpreted to expressly exclude any person or entity distributing electricity from a behind-the-meter generator to a single retail customer behind the same meter. Interpreting the term in this manner serves multiple purposes.[249] First, as currently drafted, an electrical company "includes every corporation, company, association, joint-stock company or association, partnership, or person doing business in the District of Columbia, their leases, trustees, or receivers, appointed by any court whatsoever, *physically transmitting or distributing electricity in the District of Columbia to retail electric customers*."[250] Meaning that, for example, a PV system operator selling electricity generated from the system to a single customer behind Pepco's meter would be an electrical company subject to a host of Commission regulations aimed at the Utility, like taxation and assessment requirements.[251]

While that PV system operator would be an electrical supplier selling electricity[252] and, therefore, subject to notice of construction ("NOC") requirements under D.C. Code § 34-1516,[253]

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249 Although a supplier transmitting electricity over Pepco's distribution system is clearly subject to Commission regulation, there is no clear intent for the Commission to regulate a supplier who transmits electricity over its own distribution system on the customer side of the meter.

250 D.C. Code § 34-207, "The term excludes any building owner, lessee, or manager who, respectively, owns leases, or manages, the internal distribution system serving the building and who supplies electricity and other related electricity services solely to occupants of the building for use by the occupants."

251 *See, e.g.*, D.C. Code § 47-2501(d-1), "each electric company that provides distribution services to District of Columbia ratepayers shall… [p]ay to the Mayor a tax of $0.0007 for each kilowatt-hour of electricity delivered to end-users in the District of Columbia…."

252 D.C. Code § 34-1501(17), an electricity supplier is "a person, including an aggregator, broker, or marketer, who generates electricity; sells electricity; or purchases, brokers, arranges or, markets electricity for sale to customers."

253 D.C. Code § 34-1516, "[n]o person shall construct an electric generating facility for the purpose of the retail or wholesale sale of electricity unless the Commission first determines, after notice and a hearing, that the construction of the generating facility is in the public interest."

Staff does not believe that the application of the term electrical company should be or was intended to apply to renewable energy providers selling power to a single behind-the-meter customer.[254] Nor does such an interpretation make sense in today's energy landscape.

Second, interpreting "electrical company" to exclude behind-the-meter sales of electricity to a single customer also provides clarity to stakeholders as to how certain facilities will be regulated by the Commission. This will help ensure the regulatory risk does not inhibit development of renewable distributed generation located behind-the-meter.

A draft NOPR reflecting Staff's proposed changes is attached to this Report at Attachment E. The public should comment on the appropriateness of Staff's proposed changes in conjunction with comments filed on the entirety of this Staff Report.

F. Retail or Wholesale "Sale" of Energy

1. Existing Legal & Regulatory Framework

The MEDSIS initiative explores the use of competitive markets to expand the role of distributed generation ("DG") in providing greater value to the energy delivery system. However, the Commission's ability to facilitate new competitive markets for DER within the District is limited to transactions at the retail or end-user level. The provisions of Title 34 of the D.C. Code, are to be "applied and construed free of conflict with the Constitution and laws relating to interstate commerce."[255] The Federal Power Act claims federal jurisdiction over "the transmission of electric energy in interstate commerce and to the sale of electric energy at wholesale in interstate commerce."[256] It defines "sale of electric energy at wholesale" as "a sale of electric energy to any person for resale."[257] Consequently, states' regulatory oversight is generally limited to retail sales of electric energy and the distribution of electric energy. According to some, wholesale transactions are subject to state, and not FERC, jurisdiction when both the generation facility and the wholesale purchaser are co-located on an electric utility's distribution facilities.[258] FERC, however, has not subscribed to this viewpoint.

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254 Section 1516 was added to Title 34 of D.C. Code pursuant to the 1999 Act. The Committee Report for that Act states that, with respect to the applicability of Section 1516, "if a proposed generation facility will be relatively small and unobtrusive to the surrounding community, and will increase system reliability, its construction is likely to be in the public interest." The Committee Report also states that in considering whether a generation facility is in the public interest, the Commission should consider whether it "will run on clean sources of power," as the Council wants "to encourage as much as possible, the construction of generating facilities that will produce 'clean' electricity. Thus, if a generating facility will operate on renewable sources of power, its construction is likely to be in the public interest."

255 D.C. Code §34-101.

256 *Federal Power Act* ("FPA"), 16 U.S.C. 824(b)(1*).*

257 *FPA*, 16 U.S.C. 824 (d).

258 Lindh and Bone, *State Jurisdiction Over Distributed Generators*, 34 Energy L.J 499, 524-528 (2013).

Nevertheless, states are given a limited delegation of authority under the Public Utilities Regulatory Policy Act of 1978 ("PURPA") and the Energy Policy Act of 2005 to regulate wholesale sales of electric power between qualifying small power production facilities of less than 80 MW and electric utilities. This regulation is twofold, consisting of a conditional "must-take" purchase obligation and rate-setting authority. The must-take obligation applies when the small power production facility (Qualifying Facility or "QF") does not have nondiscriminatory access to a regional competitive wholesale power market (such as the PJM Interconnect). FERC employs a rebuttable presumption, under Part 292 of its regulations (18 C.F.R.), that QFs of 20 MW or less do not have such access.[259] A state's authority to set prices in these wholesale transactions is subject to a price cap equal to the electric utility's avoided cost of power.[260] In determining this avoided cost, a state may use a multi-tiered rate structure that sets different avoided costs according to differing generator characteristics. The price applicable to the QF would be the avoided cost assigned to the generator type that matches that of the QF.[261]

A number of states have used their rate-setting authority under PURPA to implement special tariff programs under which electric utilities under their jurisdictions are required to enter into long-term purchase agreements with Distributed Energy Resources (called "Feed-In Tariffs").[262] California's Renewable Market Adjusting Tariff ("Re-MAT") program is a Feed-In Tariff program applicable to DERs with a capacity of 20 MW or less and requires a ten-year purchase commitment, with prices set under a multi-tiered avoided cost pricing structure.[263] Pricing under PURPA is intended to justify an electric utility paying above-market prices over a protracted period, sufficient to make development of DERs economically viable.

States have attempted to implement regulatory programs involving intrastate wholesale transactions. Legal arguments in support of these state programs have been made that a wholesale transaction must also be in interstate commerce before FERC jurisdiction would be triggered. However, decisions by both FERC and the Courts would indicate that this differentiation might be difficult to defend. Of particular note for MEDSIS purposes is FERC's rejection of an argument by Sacramento Municipal Utility District (SMUD). Specifically, SMUD requested that FERC limit its review of feed-in tariffs solely where wholesale transactions are involved that would be in interstate commerce and recognize that FERC has no jurisdiction over distributed generation ("DG") sales that are intrastate transactions in all respects. With little analysis or explanation, FERC dismissed SMUD's concern stating:

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259 FERC Docket No. RM05-36-000, Order No. 671, 71 FR 7852 at 50, 74 (February 2, 2006).

260 16 U.S.C. 824a-3(a)(1982).

261 18 C.F.R. 292.101(b)(6)(1985).

262 As of May 2013, these states were Hawaii, California, Maine, Oregon, Rhode Island, Vermont and Washington. U.S. Energy Information Administration, *Feed-In Tariffs or similar programs*, https://www.eia.gov/electricity/policies/provider_programs.cfm (accessed October 19, 2016.)

263 *Windy Creek Solar LLC*, 153 FERC ¶ 61,027 at 3 (October 15, 2015).

> We deny SMUD's request that the Commission clarify that distribution-level facilities and distribution-level feed-in tariffs do not implicate Commission jurisdiction. The FPA grants the Commission exclusive jurisdiction to regulate sales for resale of electric energy and transmission in interstate commerce by public utilities. The Commission's FPA authority to regulate sales for resale of electric energy and transmission in interstate commerce by public utilities is not dependent on the location of generation or transmission facilities, but rather on the definition of, as particularly relevant here, wholesale sales contained in the FPA.[264]

Other efforts by states to encourage construction of new generation such as Maryland's program that offered a contract for differences based on what a generator earned in the PJM market as well as a similar New Jersey program, have been struck down by the courts. In ruling against the Maryland program the Supreme Court opened the door for further experimentation asserting:

> Our holding is limited: We reject Maryland's program only because it disregards an interstate wholesale rate required by FERC. We therefore need not and do not address the permissibility of various other measures States might employ to encourage development of new or clean generation, including tax incentives, land grants, direct subsidies, construction of state-owned generation facilities, or re-regulation of the energy sector. Nothing in this opinion should be read to foreclose Maryland and other States from encouraging production of new or clean generation through measures "untethered to a generator's wholesale market participation.[265]

It is unclear as to what other transactional structure might be deemed "tethered" to the RTO market prices and subject to FERC jurisdiction.

Within the D.C. Code, the sale of electricity or natural gas is often a key element of the Commission's jurisdiction over an energy transaction. As part of the 1999 Act and 2004 Act, the Council of the District of Columbia curtailed the Commission's jurisdiction over energy transactions by providing that: "the supply and sale of electricity shall not be regulated by the Commission except as expressly set forth in Chapter 15 of this title; provided further, that the supply and sale of natural gas by a licensed natural gas supplier shall not be regulated by the Commission except as expressly set forth in Chapter 16C of this title."[266] Within those

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[264] *California Public Utilities Commission vs. Southern California Edison Company et. al.*, 132 FERC ¶ 61,047 (2010) at 29.

[265] *Hughes v. Talen Energy Marketing*, 578 U.S. ___ (2016) Slip. Op. at 15.

[266] D.C. Code § 34-403 (2001), referencing D.C. Code §§ 34-1501 to 34-1522 (concerning the sale and supply of electricity), and D.C. Code §§ 34-1671.01 to 34-1617.14 (concerning the sale and supply of natural gas).

provisions the presence of a "sale" is a critical component of the definition of "electricity supplier," "broker," "marketer," and "natural gas supplier" as well as providing the Commission jurisdiction over the construction of new generating facilities in the District.[267] The absence of a sale is also significant in denying the Commission jurisdiction as the Council has specified that the ownership or operation of an electric vehicle charging station is not covered by the definitions of "electrical company" or "public utility" provided that the station "does not sell or distribute electricity."[268]

2. Legal & Regulatory Challenges

The Commission asked stakeholders to comment on what constitutes the retail or wholesale "sale" of electricity produced by a distributed generating facility because, as discussed earlier, D.C. Code § 34-1516 states that "[n]o person shall construct an electric generating facility for the purpose of the retail or wholesale sale of electricity unless the Commission first determines, after notice and a hearing, that the construction of the electric generating facility is in the public interest."[269] This language raises the question of what constitutes the retail or wholesale sale of electricity, thus, requiring Commission review?[270]

Pepco asserts that a retail sale occurs when electricity is sold to an end user. A wholesale sale occurs when electricity is sold for re-sale (*i.e.*, electricity is not consumed by the purchaser but, rather, is re-sold by the purchaser).[271] Therefore, a sale between a DER and the utility or the wholesale market would be a "wholesale sale," because assuming the utility or wholesale market would resell the electricity to other consumers, such sales trigger FERC jurisdiction.[272]

The District Government, while not having a workable definition to provide, notes that the definition of "sale" was developed when there was only one-way power flow and now the "existing definition is rigid."[273] The District Governments suggests a modification to the definition of "sale" that would facilitate anticipated Smart Grid and DER, carefully developed by stakeholders.[274] DC Climate Action asserts that "no retail or wholesale 'sale' of electricity is

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267 *See* D.C. Code § 34-1501 (7), (17), (19) (2001), D.C. Code § 34-1671.02 (12) (2001), and D.C. Code § 34-1516 (2001).

268 *See* D.C. Code § 34-207 (2001), and D.C. Code § 34-214 (2001).

269 *Formal Case No. 1130*, Order No. 18144, ¶ 6, rel. March 18, 2016.

270 This language also raises the question of whether microgrids producing excess energy for sale in the District are subject to electric supplier license requirements.

271 Pepco's Comments to Order No. 18144 at 25.

272 Pennoni Comments to Order No. 18144 at 13-14.

273 DOEE/DCG Comments to Order No. 18144 at 11.

274 DOEE/DCG Comments to Order No. 18144 at 11.

involved when a distributed generation facility is serving the needs of its owner(s) or a limited set of users."[275]

3. Recommended Action

Since the electricity market has developed beyond the operating concepts that formed the basis of the 1999 Act, the Commission needs flexibility in when and how to regulate the sale of electricity consistent with new technologies and with current policies supporting the goals that have been articulated in the Mayor's Plan for a Sustainable DC and the legislative mandates that have been set out in key pieces of legislation such as the CAEA. The sale of electricity under comprehensive contracts between a behind-the-meter generator and a customer behind the same meter for fixed periods of time, such as through a PPA, does not require the same level of Commission supervision as sales involving competitive suppliers who purchase energy in wholesale markets, wheel it across the distribution system, and sell it to customers on a month-to-month basis.

Staff notes that such sales-related concerns are not applicable to the District's natural gas market because there is no "generation" of natural gas behind-the-meter. All natural gas continues to be wheeled across the distribution system to the customer as envisioned by the 2004 Act.

RA

Amend Regulatory Definition of "Electricity Supplier"

One approach to clarifying the role of energy sales within the Commission's jurisdiction is to amend various statutory definitions of "electricity supplier," "broker," and "marketer"[276] to provide the greatest clarity about what type of sale is covered. Another approach would be for the Commission to seek specific statutory authority to define "sale" through our regulations so that the Commission can adapt the definition as new market opportunities develop.

Alternatively, the Commission could amend its definition of "electricity supplier" to exclude "[a]ny person or entity who owns a behind-the-meter generator and sells or supplies the electricity from that generator to a retail customer or customers behind the same meter." Such an exemption does not contravene the 1999 Act as it focused on suppliers connecting the wholesale market, through the distribution system, to the customer, while a behind-the-meter PPA is more

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[275] DC Climate Action Comments to Order No. 18144 at 2 (April 18, 2016). Several of the commenters seem to be in agreement about the definition of retail versus wholesale "sale" of electricity – nothing that net metering is not a sale of electricity because it involves rollover credits and not the exchange of money for over producing energy.

[276] *See* D.C. Code § 34-1501 (7), (17), (19) (2001), and D.C. Code § 34-1671.02 (12) (2001).

akin to a customer-generator[277] and does not utilize the distribution system for electricity delivery. Other changes may be appropriate to exempt any generation that does not use Pepco's lines from the definition of "retail sale" so as to ensure that distributed generation ("DG") and microgrids are not over regulated.

A draft NOPR reflecting Staff's proposed changes is attached to this Report at Appendix E. The public should comment on the appropriateness of Staff's proposed changes in conjunction with comments filed on the entirety of this Staff Report.

G. Distributed Resource Planning

1. Existing Legal & Regulatory Framework

Currently, there are no statutes or Commission rules that address Distributed Resource Planning in the District.

2. Legal & Regulatory Challenges

Several stakeholders assert that the Commission should require investor-owned utilities to develop Distribution Resource Plans ("DRP") that take into account existing and future DER projects. The District Government asserts that a utility DRP should identify optimal locations for DER; propose standard tariffs and contracts to facilitate DER deployment; and provide a granular picture of the distribution system's characteristics.[278] OPC also asserts that the Commission should require the Districts energy utility companies to develop and submit detailed grid modernization and DER integration plans similar to those submitted in California, Hawaii, and New York.

In Section 5 of the Integration Plan submitted by Pepco on June 21, 2016, as required by the Merger agreement, Pepco Holdings, Inc. ("PHI") notes that "Distribution System Planning develops feeder, distribution substation transformer, and total distribution substation peak load projections over a ten-year period – taking into account the impact of existing and pending DERs" and "PHI is working to develop a method to forecast future anticipated DERs (*i.e.* those neither in operation currently nor those known to be pending) and appropriate criteria to incorporate such resources into its planning process."[279] PHI further asserts that it "is in the process of developing four key modifications to its planning process that addresses the commitment for incorporating the impact of distributed renewable energy:

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277 D.C. Code § 34-1501 (15) (2001) ("Customer-generator" means a residential or commercial customer that owns and operates an electric generating facility that: (A) Has a capacity of not more than 1000 kilowatts; (B) Uses renewable resources, cogeneration, fuel cells, or microturbines; (C) Is located on the customer's premises; (D) Is interconnected with the electric company's transmission and distribution facilities; and (E) Is intended primarily to offset all or part of the customer's own electricity requirements.)

278 DOEE/DCG Comments to Order No. 18144 at 6.

279 Integration Report at 40. Staff notes that on September 26, 2016, Pepco filed an updated PHI Integration Plan in Formal Case No. 1119.

(1) The creation of a five-year NEM [photovoltaic (PV)] forecast based upon historical interconnection applications by PHI utility.
(2) Incorporation of the forecasted PV capacity and corresponding load reductions into the short-term load forecast and the Ten-Year Load Forecast (which are the key inputs in the Distribution System Planning Process and the initiation of the construction recommendation process).
(3) Reconciliation of historical peaks for planning purposes, the peak values will be adjusted to account for solar capacity additions.
(4) Incorporation of criteria to account for active and planned DERs under different operating conditions and system restoration efforts that ensure operations under multiple system configurations.[280]

However, based on what has been provided in the Integration Report, some initial considerations for the Commission are: (1) whether PHI's proposed Distributed Resource Plan components are sufficient, or whether additional information and data is needed; (2) how long PHI's short-term planning period should be (3 years, 5 years?); and (3) what kind of data Pepco needs to release to market participants in order to facilitate DER penetration (*i.e.*, identify optimal locations for DERs on the system).

3. Recommended Action

On June 30, 2016, Pepco filed an Application requesting authority to increase existing distribution service rates and charges for electric service in the District of Columbia by $85.5 million, representing an increase of approximately 23.7% increase in Pepco's distribution revenues.[281] On September 22, 2016, the Commission in Order No. 18550, designated the issues and established the procedural schedule for this proceeding.[282] In Attachment A, Issue No. 18 of the Order, the Commission designates the following issue regarding Pepco's short-term and long-term load forecasting: Are Pepco's short-term and long-term load forecasts reasonable?

a. Is Pepco's load forecast used in formulating the construction budget and driving the distribution system planning reasonable?
b. Does Pepco's load forecast reasonably and properly account for the effects of environmentally beneficial and load reducing measures on the load growth projections and capital requirements included in the Construction Program Report, including: (a) solar and other forms of customer-owned, behind-the-meter

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280 Integration Report at 40-41.

281 *Formal Case No. 1139, In the Matter of the Application of Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service* ("*Formal Case No.* 1139"), at 3, filed June 30, 2016 ("Pepco's Application"). In supplemental testimony, Pepco revised its request to $82.1 million, representing a 22.72% increase in distribution revenues.

282 *Formal Case No.* 1139, Order No. 18550, rel. September 22, 2016 ("Order No. 18550").

generation; (b) energy storage facilities; (c) energy efficiency; (d) energy conservation; and (e) similar load reducing measures?

c. Are the system, substation and feeder level load growth projections used to justify the Reliability projects, Customer Driven projects, and Load projects contained in the Construction Program Report reasonable?

d. What steps should be taken to improve Pepco's short-term and long-term load forecast process and reporting for the future?[283]

Since this issue directly relates to Pepco's future Distribution Resource Planning and is currently being litigated in Formal Case No 1139, Staff recommends that this issue be revisited after the final order in Formal Case No. 1139 is issued to determine what, if any, additional recommendations should be proposed to the Commission. Preliminarily, however, Staff believes that it is important that Pepco provide a robust Distribution Resource Plan. To that end, Staff recommends that the Commission direct Pepco to review and respond to some of the key initial considerations noted above as the plan is developed. However, any recommendations should come out of Formal Case No. 1139. Internally, the MEDSIS team will continue to review best practices in the industry as it pertains to Distribution Resource Planning and be prepared to follow-up the Final Order in Formal Case No. 1139 with additional recommendations on this topic if necessary.[284]

VI. ECONOMIC ASPECTS OF MEDSIS

A. Introduction

The theory and practice of economic regulation can be found at the heart of every discussion of energy delivery modernization. The District of Columbia MEDSIS proceeding is no exception. There are several reasons for this. In the first place, local distribution of natural gas and electricity are regulated monopolies, with the Commission setting rates for distribution service through contested proceedings that are governed by precedent and statute. Based on evidence, the Commission approves rates that are "just and reasonable."

Furthermore, distribution system modernization raises the possibility of new types of services and new investments by the regulated utilities, requiring the modification of the existing rate structure or the creation of new types of tariffs. It also puts on the table new opportunities for third-party investors seeking to provide new services to either the regulated utility or distribution system customers, or both. Finally, the modernization debate has also put forward the idea that new communication and generation technologies may make possible a restructuring of electric

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283 *Formal Case No.* 1139, Order No. 18550, Attachment A, Issue No. 18.

284 "Substantive stakeholder involvement in the utility planning process beginning now, and institutionalized into the future – independent of the PSC and docketed cases." *Formal Case No. 1130*, Comments of the Grid 2.0 Working Group, DC Climate Action, DC Environmental Network, and Chesapeake Climate Action Network Comments to Order 18144, at 3, filed July 25, 2016 ("Grid 2.0, DC Climate, DCEN, and CCAN Collective Comments to Order No. 18144").

distribution systems analogous to the deregulation of generation and transmission that has been implemented in about half of the states in the country.

This section will identify a number of the key issues of economic regulation raised by participants in the MEDSIS proceeding. Selected comments of MEDSIS participants are cited below for illustrative purposes; no attempt is made to provide a comprehensive summary of all input pertaining to economic regulation.

The rates charged by a regulated utility allow it to recover the costs of providing service, including a market rate of return. Ratemaking principles require that these costs be fairly apportioned among the different classes of customers served.

Under the laws of the District of Columbia, the Commission sets rates for the provision of electric distribution service only. Distribution service accounts for roughly one quarter of residential electric customers' bills; the remainder represents the cost of generation and transmission service. Generators sell their output in the PJM wholesale market; Pepco conducts annual auctions for default energy service (under Commission supervision) while competitive retail electricity suppliers procure energy on behalf of their customers. Transmission rates are regulated by the Federal Energy Regulatory Commission ("FERC").

With respect to ratemaking, the MEDSIS proceeding challenges us to consider whether (1) ratemaking can be adjusted to give the both customers and the electric distribution company incentives to meet peak demand through less costly approaches and (2) market forces be used to harness third parties to provide less costly means of serving peak demand?[285] The Grid 2.0 Working Group, DC Climate Action, DC Environmental Network, and Chesapeake Climate Action Network urged the Commission to "[s]timulate and promote a 'sharing economy' and 'energy democracy' so that locally owned renewable energy and locally owned micro-grids flourish—distribute wealth and benefits within the city, and integrate seamlessly with the current system."[286] Pennoni argued that:

> Effective competition at the retail level is likely the best way to facilitate and encourage the development of DERs that will in turn modernize the grid and support increased sustainability. Competition, by its nature, creates an incentive for innovation and lowers prices. Thus, competition at the retail level between utilities, governments and commercial enterprises will create incentives for utilities and other businesses to innovate, invest in new

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[285] The New York Commission "found that significant technological innovation in software and hardware systems that improve the intelligence and flexibility of the delivery system, and similar advances that have significantly reduced the cost and increased the value of DERs, present the opportunity to fundamentally improve how utilities meet their service obligations." NY PSC Case 14-M-0101 - Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision; Staff White Paper on Ratemaking and Utility Business Models (July 28, 2015) at 2.

[286] *Formal Case No. 1130*, Comments of the Grid 2.0 Working Group, DC Climate Action, DC Environmental Network, and Chesapeake Climate Action Network, at 3, filed July 25, 2016.

> technology, and provide new services. This innovation will drive the creation of a modern electricity delivery system and will bring benefits to all citizens, in terms of reliability, resiliency, lower CO_2 emissions and affordable prices for energy.[287]

In the District of Columbia, similarly to other so-called restructured jurisdictions, customers' electric bills are divided into three service components: generation ("G"), transmission ("T"), and distribution ("D"). This is known as "unbundled service."

- "G" represents the generation of energy and is measured in kilowatt hours ("kWh"). Most energy is produced at large, central power generation stations that are connected to the distribution system by transmission lines. The price of energy is established in wholesale markets under rules governed by the Federal Energy Regulatory Commission ("FERC"). For the region that includes the District, the market is operated by PJM.

- "T" represents the transmission of energy between generating stations and local distribution system over high-voltage transmission lines. Rates for transmission service are cost-based and determined by the FERC.

- "D" stands for the distribution system that connects high-voltage transmission lines to the lower voltage power lines that run through neighborhoods and connect to homes and businesses. Included are the costs of substations and lower voltage power lines ("feeders") as well as administrative and billing costs.

New technologies have increased the opportunities for electricity customers – residential, commercial, and governmental – to supply their own energy needs through DERs. DERs also may have the potential to provide valuable services to the distribution system at a lower cost than traditional utility investments. (Many commenters use the word "grid" which confuses distribution and transmission services which are very different, in both physical and regulatory terms.)

Future deliberations of DER-related rate changes will not occur in a vacuum. DERs aside, there is substantial contention among stakeholders in every base rate case with regard to the fairness and efficiency of the existing rate structure, unrelated to DER.[288] These ongoing conflicts, which may be a natural part of the rate-setting process, are likely to have significant impact on the evolution of DER rate policies.

While Staff provides a discussion of various economic issues related to the MEDSIS Initiative, due to the fact that the Commission has several open proceedings, most notably Formal Cases Nos. 1137 (WGL rate case) and 1139 (Pepco rate case), that are currently litigating the very

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287 Comments of Pennoni to Order No. 18144 at 2.

288 Under the rates established in the last base rate case, the "R" class of residential customers does not cover its cost of service. The Commission is committed to addressing this on a gradual basis. *See Formal Case No. 1103*, Order No. 17424, ¶ 438, rel. March 26, 2014.

same topics discussed in this section, Staff has refrained from making any recommendations to the Commission. Instead, Staff believes it is appropriate to revisit these issues after the final orders have been issued in the rate proceedings. At that time, Staff will determine, based on the directives from the Commission, whether additional recommendations on these matters should be given.

B. Load Forecasting & Distribution System Planning

Several participants have highlighted, in their view, the centrality of distribution system planning for MEDSIS. For example, the District Government states:

> One of the most significant challenges to achieving the goals of FC 1130 may be the lack of system information and signals provided to the market. As already mentioned, some states have taken the first steps to modernizing the grid, and in each of these states, distribution-level planning is one of the first undertakings.[289]

The District Government further asserted that "The Commission could begin this work by convening a working group with the task of developing a plan to evaluate Pepco's assessment of system capacity and projected demand growth in the area and a consensus strategy to mitigate, delay or optimize the ratepayer-financed investment."[290]

Other MEDSIS participants joined this call for a more open and transparent process for planning the electric distribution system in the District of Columbia to facilitate modernization and identify DER investment opportunities. Because the value of DER for the distribution system appears to be very sensitive to location, some parties have argued for more granular planning information. The Microgrid Resources Coalition pointed out that:

> Legislation passed in 2013 requires utilities to submit distributed resources plan proposals to the California Public Utilities Commission for approval. The plans identify optimal locations for the deployment of distributed resources.[291]

The Coalition urges the Commission to consider "a process for unsolicited proposals from microgrid providers to meet needs identified in distribution system planning."[292]

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289 DOEE/DCG Comments to Order No. 18144 at 5.

290 *Formal Case No. 1130*, District Government of Columbia Supplementary Comment for the Third Information Session, at 3, filed May 23, 2016 ("DCG Supp. Comments to Order No. 18144").

291 *MRC* Comments to Order No. 18144 at 7.

292 *MRC* Comments to Order No. 18144 at 8.

Grid 2.0 argues that "Optimization of DER on the distribution, transmission, and generation elements of the District's electric grid should be a value function of location (integrated distribution planning); set by the PSC, and periodically balanced as necessary."[293]

The Commission has ordered load forecasting and distribution system planning to be included in Formal Case No. 1139, Pepco's Application for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Service in Issue 18*:*

> Are Pepco's short- term and long-term load forecasts reasonable?
>
> a. Is Pepco's load forecast used in formulating the construction budget and driving the distribution system planning reasonable?
> b. Does Pepco's load forecast reasonably and properly account for the effects of environmentally beneficial and load reducing measures on the load growth projections and capital requirements included in the Construction Program Report, including: (a) solar and other forms of customer-owned, behind-the-meter generation; (b) energy storage facilities; (c) energy efficiency; (d) energy conservation; and (e) similar load reducing measures?
> c. Are the system, substation and feeder level load growth projections used to justify the Reliability projects, Customer Driven projects, and Load projects contained in the Construction Program Report reasonable?
> d. What steps should be taken to improve Pepco's short-term and long-term load forecast process and reporting for the future?[294]

The Commission also ordered parties to consider Issue 6 in Formal Case No. 1137, WGL's Application for authority to increase exiting rates and charges for Gas Service; and to revise terms and conditions related to gas service in the District of Columbia:

> Is WGL's long-term plan for capital expenditure projects (including test year projects) reasonable, appropriate, and complete? Does WGL's long term plan support goals to provide a safer, reliable, efficient, and cost effective delivery of energy in the District?[295]

Staff recommends suspending consideration of distribution system planning in Formal Case No. 1130 pending the final orders in Formal Case Nos. 1137 and 1139. There may be interest in

[293] *Formal Case No. 1130*, Grid 2.0, DC Climate, DCEN, and CCAN Collective Comments to Order No. 18144 at 3, filed July 25, 2016.

[294] *Formal Case No. 1139*, Order No. 18550, at Attachment A, page 3.

[295] *Formal Case No. 1137*, *In The Matter of The Application of Washington Gas Light Company For Authority To Increase Existing Rates and Charges For Gas Service* ("*Formal Case No. 1137*"), Order No. 18172, Attachment A ("Order No. 18172").

resuming discussion of this topic under the MEDSIS rubric in order to pursue matters not covered by the final order in either case.

C. Demand Management

A number of MEDSIS participants addressed the potential of demand management programs of various types to reduce system and/or substation peak demands. For example, the presentation by H.G. Chissell on behalf of the Advanced Energy Group highlighted experiences in New York City with the Distribution Load Relief Program and the Commercial System Relief Program.[296] He also explained the Brooklyn Queens Demand Management project and the Distributed Storage Incentive program, among others.

In Formal Case No. 1139, Pepco has proposed Adjustment 27 - Reflection of Direct Load Control (DLC) Program Costs.[297] Pepco's demand management program is also under consideration in Formal Case No. 1086 – Pepco's request for approval of a residential air conditioner direct load control program.[298] In view of the open proceedings related to demand management in the District of Columbia, the Staff cannot provide further any analysis or recommendation on this topic.

D. Time-Varying Rates

DC Climate Action stated: "Now that a body of experience is building in other jurisdictions, and that smart meters are fully deployed in the District, evaluate the cost/benefit of Time-Variant Pricing options as default (with opt-out), combined with critical peak rebates for load shifting."[299]

DC Sun recommended "dynamic pricing that allows customers to respond to real-time price signals."[300] The Institute for Policy Integrity commented that "The lack of dynamic pricing not only insulates consumers from receiving correct signals about the true cost of electricity, it also limits the incentives for distributed energy resources ("DER") to achieve maximum social benefit, as existing rate designs do not capture the full value of distributed energy resources."[301]

296 *Formal Case No. 1030*, Advanced Energy Group presentation; MEDSIS Workshop, filed April 28, 2016.

297 *Formal Case No. 1139*, Direct Testimony of Ziminsky (June 30, 2016) at PEPCO (E)-1 Page 32.

298 *See Formal Case No. 1086*, Potomac Electric Power Company's Annual Direct Load Control ("DLC") Program Report, filed April 1, 2016.

299 *Formal Case No. 1130*, DC Climate Action Initial Comments, at 9, filed September 1, 2015 ("DC Climate Action Initial Comments").

300 *Formal Case No. 1130*, DC Solar United Neighbors Initial Comments, at 5, filed August 31, 2015 ("DC SUN Initial Comments").

301 *Formal Case No. 1130*, Institute for Policy Integrity at New York University School of Law Comments, at 12, filed August 31, 2015 ("NYC Law Comments").

Some have suggested modifications to generation rates to achieve the goals of demand reduction and energy efficiency. These could include time of use rates ("TOU") that charge higher kWh rates at certain times of day and of the year, or peak rates that are higher on the very hottest (or coldest) days. TOU rates could be offered on an opt-in or opt-out basis.

The significant mismatch between flat retail electricity rates and the dramatic temporal variation in the actual cost of electricity production sends poor price signals to customers. Time-varying rates ("TVR") can partially or even fully remedy this problem.

Many economists have identified – for decades – TVR pricing as a best practice for rate design; most commercial and industrial customers have some form of TVR.[302] Well-designed time-varying pricing may encourage customers to minimize electricity use during high cost periods, helping to reduce utility system costs over time. Some describe TVR as the key to "flexible load" which envisions technology-enabled individual customers and aggregators responding to incentives to shift the times when energy is used; flexible load is another form of DER.[303]

Consumer advocates tend to be skeptical of time-varying rates in part because of the impact on low-income households, households with older or very young members or with medical conditions; these households may have less ability than more sophisticated customers to respond to the incentives offered. Time-varying rate designs may make customer bills less stable and shift price risk from the utility to consumers. That's particularly the case with real-time pricing, where electricity rates fluctuate frequently (*e.g.*, every hour) to reflect changes in market prices.

Recent studies have found that residential consumers can adjust their usage effectively under other forms of time-varying rates, such as traditional time-of-use rates with on- and off-peak periods — and critical peak pricing variations that add a very high price during a very limited number of hours of the year.[304]

Another consideration is that under flat-rate pricing, "peaky" customers — who use more electricity when it is most expensive for the utility to acquire — are subsidized by less "peaky" customers who use more off-peak, inexpensive electricity. In general, distribution systems costs are higher when system load factor is lower.[305]

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302 Wood, Lisa, et al; *Recovery of Utility Fixed Costs: Utility, Consumer, Environmental and Economist Perspectives*, Lawrence Berkeley National Laboratory Future of Electric Utility Regulation Report No. 5 at 71 June 2016. https://emp.lbl.gov/sites/all/files/lbnl-1005742_1.pdf.

303 Rocky Mountain Institute, The Economics of Demand Flexibility: "*How Flexiwatts Create Quantifiable Value for Customers and The Grid"* (August 2015). http://www.rmi.org/electricity_demand_flexibility.

304 Wood, Lisa, et al; *Recovery of Utility Fixed Costs: Utility, Consumer, Environmental and Economist Perspectives*; Lawrence Berkeley National Laboratory Future of Electric Utility Regulation Report No. 5 at 72 (June 2016). https://emp.lbl.gov/sites/all/files/lbnl-1005742_1.pdf.

305 System load factor is the average load divided by the peak load in a specified time period.

Noting the variation in customer tolerance for this price risk, some recommend maintaining different rate options that allow customers to choose depending on their tolerance. Other observers hold that time-varying rates are "cost-effective for virtually all customers" due to falling costs of advanced metering infrastructure.[306]

The NARUC Manual notes that there are several types of "time-varying rates" including time of use, real-time pricing, dynamic pricing, and critical peak pricing.[307] These rate designs are intended to encourage consumers to shift usage away from peak times in order to lower peak demand; the NARUC Manual also notes that this can be accomplished with demand charges. The NARUC Manual goes on to describe the challenge of distributed generation ("DG") for regulated utility ratemaking:

> Rate making is often the result of a regulator balancing a variety of interests and goals of the parties, as well as technological and political considerations. The prevailing rates for any given utility represent a history of compromises—on goals, on the balancing of different rate design philosophies, on the practicality of a given rate component based on available data, and so forth. Given this history of compromises, there have always been "winners" and "losers" in rate design; DER just potentially shifts who are those winners and losers. The question then becomes whether the entirety of the rate structure that would apply to all customers of a given class, including DER customers, should be modified to better match cost-causative factors, or whether a special rate should be created that applies only to DER customers. There is a strong argument to be made for changing the rate structure that applies to all customers, as sending all customers the most appropriate price signal should result in the most economically efficient outcomes related to electricity consumption, as well as decisions on the installation of DER. For a number of reasons, regulators may decide this is not the best approach to recommend or to approve (e.g., promotion, neutrality, or demotion of DER; availability of data; customer acceptance or fears related thereto).[308]

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306 Wood, Lisa, et al, *Recovery of Utility Fixed Costs: Utility, Consumer, Environmental and Economist Perspectives*; Lawrence Berkeley National Laboratory Future of Electric Utility Regulation Report No. 5 at 72 (June 2016). https://emp.lbl.gov/sites/all/files/lbnl-1005742_1.pdf.

307 *Distributed Energy Resources Rate Design and Compensation: A Manual Prepared by the NARUC Staff Subcommittee on Rate Design* at 26-31 (November 2016). http://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0.

308 *Distributed Energy Resources Rate Design and Compensation: A Manual Prepared by the NARUC Staff Subcommittee on Rate Design* at 75 (November 2016). http://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0.

This NARUC passage articulates the difficulty of separating rates and tariffs for DERs from questions related to the extant general rate structure. At the present time, both the electric and natural gas distribution companies have applied to increase their rates for distribution service and their applications are being considered by the Commission

In Formal Case No. 1139, the Commission ordered parties to provide testimony on Issue 15(f):

> Should Residential Time Metered ("RTM") tariff/rates be restructured and if so, how?[309]

Currently, the RTM tariff/rate has a flat rate design. Finally, it should be noted that the policy, economic, legal and technical issues and questions related to establishing a dynamic pricing plan in the District of Columbia are under consideration in Formal Case No. 1114.

Additionally, it should be noted that in Formal Case No. 1137 (WGL's rate case), the Commission ordered parties to address Issue 17:

> Are the proposed rate design and tariff changes, including but not limited to Rate Schedules 3 and 3A (interruptible customers), the proposed Rate Schedules 7 and 7A (combined heat and power/distributed generation facilities), the Multi-Family Piping Program, and the treatment of group-metered apartment customers under proposed Rate Schedules 2B and 2C reasonable in this case?[310]

In light of the open proceedings related to time-varying rates, in particular, and distribution utility rates, in general, before the Commission, the Staff cannot discuss this topic further.

E. Standby Tariff

According to the NARUC Manual, "Standby charges are charges assessed by utilities to customers with DER systems that do not generate enough electricity to meet their needs or may experience a planned or unplanned outage and therefore must receive power from the grid."[311] Typically, standby charges apply to larger industrial or commercial customers with their own generation and have not been applied to small residential renewable systems.[312] The Northeast

309 *Formal Case No. 1139*, Order No. 18550, Attachment A, at 3, rel. September 22, 2016.

310 *Formal Case No. 1137*, Order No. 18172, Attachment A, at 2-3, rel. April 21, 2016.

311 *Distributed Energy Resources Rate Design and Compensation: A Manual Prepared by the NARUC Staff Subcommittee on Rate Design* at 120 (November 2016). http://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0.

312 *Distributed Energy Resources Rate Design and Compensation: A Manual Prepared by the NARUC Staff Subcommittee on Rate Design* at 120-123 (November 2016).

Energy Efficiency Partnerships recommended that the Commission include standby tariffs among the topics it considers.[313]

Pepco's Standby Service Schedule "S" says: "A monthly reservation charge of $.45 per kw of contract demand shall be billed by the Company for standing ready to provide standby service. The contract demand shall be the maximum capacity for which the Company stands ready to serve."[314] The potential for the imposition of this tariff could be a disincentive for DER investors. However, so long as Pepco has an obligation to deliver energy to load in the event that the DER generator fails, then there are costs to provide that distribution service capacity. If those costs are not paid by the DER customer, then they will be spread among the remaining customers on the system.

In light of the open proceedings related to distribution utility rates before the Commission, the Staff cannot discuss this topic further.

F. Revenue Decoupling

Revenue decoupling severs the link between revenue and sales, allowing the distribution company to recover its revenue requirement even when kWh or therms per customer declines. In the words of the NARUC DER Manual, "Decoupling is intended to mitigate or eliminate revenue fluctuation for the utility resulting from the installation of energy efficiency and demand resource technology, DER, and external factors such as weather, economic conditions, and power outages."[315]

DC Climate Action urged the Commission to "Examine benefits of decoupling gas revenues from volume distributed, as was done successfully in the District in the case of electricity revenues, several years ago."[316]

The Commission adopted a revenue decoupling mechanism for Pepco in Order No. 15556, issued on September 28, 2009, in Formal Case No. 1053. Recently parties have raised questions about how the monthly customer numbers used by Pepco to adjust the monthly BSA surcharge.[317]

In Formal Case No. 1139, the Commission ordered parties to address Issue 4:

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313 *Formal Case No. 1130*, Northeast Energy Efficiency Partnerships Comments, at 4, filed August 31, 2015.

314 Pepco Standby Service Schedule "S;" First Revised Page No. R-16.

315 *Distributed Energy Resources Rate Design and Compensation: A Manual Prepared by the NARUC Staff Subcommittee on Rate Design*, at 35 (November 2016). http://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0.

316 DC Climate Action Initial Comments, at 3.

317 District of Columbia Public Service Commission Docket PEPBSAR.

Should Pepco's BSA Mechanism be continued and, if so, what changes to the mechanism, if any, are necessary and appropriate?

a. Has Pepco reasonably and appropriately developed the revenues per customer that will be used in BSA determinations subsequent to the conclusion of this proceeding?
b. If the BSA is continued, what forecasts of kWh per rate class should be used in the monetary computation of monthly rate adjustment ($/kWh)?
c. Are Pepco's test year numbers of customers and revenues developed in a manner consistent with the actual data presented in its BSA filings?
d. How would the BSA mechanism be adjusted if MMA customer count changes from number of dwelling units to the number of buildings?[318]

Washington Gas has proposed a Revenue Normalization Adjustment to achieve gas decoupling in Formal Case No. 1137. Based on the fact that this issue is currently being litigated in Formal Case Nos. 1137 and 1139, Staff recommends that the Commission takes no action until those proceedings have finished.

G. Cost Effectiveness of Distributed Energy Resources

Several MEDSIS participants urged the Commission to develop or adapt an existing benefit-cost analysis framework for the evaluation of DER additions and distribution system investments. DC Climate Action recommended that the Commission should "Review cost effectiveness tools to adequately account for public health benefits of efficiency and renewables."[319] OPC commented that "Understanding the value of grid-modernization technology and distributed energy resources, such as distributed solar or microgrids, through a robust analysis of their costs and benefits is necessary to ensure that energy costs are affordable for all consumers."[320]

Kahrl, F, et al (September 2016) summarize the methodologies available for evaluating the cost effectiveness of distributed generation.

> Cost-effectiveness tests can be used to screen potential distributed generation ("DG") applications. In the context of resource planning, relevant tests include:
>
> - The *utility cost test*, which indicates the extent to which distributed generation will reduce the utility's revenue requirements;
> - The *total resource cost test*, which indicates the extent to which distributed generation will reduce the total costs to the utility system and the host customer;

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318 *Formal Case No. 1139*, Order No. 18550, Attachment A, at 1, rel. September 22, 2016.

319 DC Climate Action Initial Comments, at 3.

320 OPC's Comments in Response to Order No.18844, at 10, filed April 18, 2016.

- The *societal cost test*, which indicates the extent to which distributed generation will reduce total costs to society, including externalities; and
- The *ratepayer impact measure* test, which indicates the degree to which distributed generation impacts the bills of nonparticipants.[321]

In Formal Case No. 1139, Pepco has proposed Adjustment 27 – Reflection of Direct Load Control ("DLC") Program Costs.[322] Pepco has cited its cost effectiveness analysis in support of this proposed adjustment.[323] Because the Commission has yet to make a decision on this issue, Staff can provide no further analysis or recommendation on the cost effectiveness of the DLC program.

H. Performance-based Ratemaking

Several participants argued for including performance-based ratemaking in the MEDSIS proceeding. For example, GRID 2.0 asserted that "MEDSIS should optimize tariff structures to enable and expedite technology adoption and other desirable policy prescriptions. The role of performance based rate-making on linking tariffs to performance outcomes (and cost-benefit) should inform the process."[324] DC Climate Action urged the Commission to "Review and adopt Performance-based Rate Design to incentivize (and remove disincentives from) the optimization of energy efficiency and integration of clean energy resources in distribution systems."[325] Smarter Grid Solutions, Inc. similarly commented: "It is suggested a shift from cost-based to performance-based regulation should be considered within the scope of the Commission's proceedings. Performance-based regulation incentivizes utilities to achieve certain targets that deliver more holistic value to customers. Performance targets could include: environmental goals, system-wide efficiency, greater customer engagement, and increased DER integration."[326]

Performance-based ratemaking ("PBR") is a modification of traditional "cost of service" ratemaking. PBR can be implemented either through specific performance indicators or as a wholesale transformation, as with multi-year rate plans ("MRPs"). The following is the sequence of steps needed to define performance improvement measures ("PIMs") for a PBR program, suggested by several analysts.[327]

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321 Kahrl, F, *et. al*, at 66-67, September 2016.

322 *Formal Case No. 1139*, Direct Testimony of Ziminsky, PEPCO (E)-1 at 32, filed June 30, 2016.

323 *Formal Case No. 1139*, Direct Testimony of Lefkowitz, at 5:3-8, filed June 30, 2016.

324 *Formal Case No. 1130*, Grid 2.0, DC Climate, DCEN, and CCAN Collective Comments to Order No. 18144, at 3, filed July 25, 2016.

325 DC Climate Action Initial Comments at 9.

326 *Formal Case No. 1130*, Smarter Grid Solutions Inc. Initial Comments, at 2, filed August 31, 2015.

327 Whited M., Woolf T., and Napoleon A. (2015); *Utility Performance Incentive Mechanisms: A Handbook for Regulators*; prepared for the Western Interstate Energy Board. http://www.synapse-energy.com/sites/default/files/Utility%20Performance%20Incentive%20Mechanisms%2014-098_0.pdf.

- Goals: What utility performance is desired and what quantitative targets can be used to measure desired performance outcomes?
- Existing incentives: A clear understanding of the incentives shaping utility decision making under current arrangements is helpful in establishing the rationale for change.
- Performance: Those areas of utility performance that warrant metrics based on policy goals should be identified.
- Reporting: Performance must be measured in a reliable, consistent fashion for reporting purposes.
- Targets: To provide clear direction to utilities, targets can be established to express the desired performance outcomes.
- Incentives: Appropriate penalties and rewards can be formulated around targets.
- Evaluate: Over time, experience with measurement, target levels and incentives should be assessed and changes made, if necessary.

PIMs can also be combined with a MRP. If the main concern of utility regulators "is to improve performance in specific areas, stand-alone PIMs might be sufficient to address these areas. If they instead seek wide-ranging performance improvements, including better capital cost management, [then] MRPs may be better suited to these goals than PIMs alone."[328]

Lowry and Woolf argue that MRPs can facilitate DERs:

> [Multi-year Rate Plans] can improve utility incentives to embrace DERs, if properly designed. Inherent advantages include the general incentive they can provide to slow rate base growth. Since DERs can be effective tools for reducing rate base growth, utilities have a stronger incentive to embrace them. For example, if a utility uses DERs to reduce the need for substation capex, it can keep some of the cost savings for several years, and possibly longer if there is a well-designed efficiency carry-over mechanism.[329]

It is well-established that, under cost-of-service regulation, whenever a utility's authorized rate of return is greater than the cost of raising capital, there may be a financial incentive to increase capital expenditures in order to increase rate base and thereby increase profits. Theoretically, prudence reviews can mitigate some of the incentive for excessive capital expenditures.

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328 Lowry, M. and Woolf, T. (2016); *Performance-Based Regulation in a High Distributed Energy Resources Future*; Lawrence Berkeley National Laboratory Future of Electric Utility Regulation Report No. 3 at page 63. https://emp.lbl.gov/sites/all/files/lbnl-1004130_0.pdf.

329 Lowry, M. and Woolf, T. (2016); *Performance-Based Regulation in a High Distributed Energy Resources Future*; Lawrence Berkeley National Laboratory Future of Electric Utility Regulation Report No. 3 at page 26.

However, in practice, prudence reviews and disallowances are rare, burdensome, and are mostly applied to large capital expenditures.[330]

In Formal Case No. 1139, the Commission ordered parties to provide testimony on Issue 19:

> Should the Commission explore alternative ratemaking structures? (For example, a fully forecasted test year, Performance Based Ratemaking ("PBR"), price regulation, ranges of authorized return, categories of services, price-indexing, and or other alternative mechanisms). If so, which, why, and what elements of Pepco's rates, incentives, and operations and expenses are potential candidates for PBR?[331]

The Commission cites the District of Columbia statute permitting the use of "alternative forms of regulation."[332] Staff can offer no analysis on this topic pending the outcome of Formal Case No. 1139.

I. AMI Data

Several participants have argued that better use of AMI data could be made by identifying and pursuing opportunities to utilize the data collected by the smart meters already installed across the District. For example, GSA argued that "the Commission should examine how AMI investments can facilitate the integration of DG resources in distribution networks (for example, the development of network microgrids) by facilitating the exchange of data between customers, network operators, and resource suppliers."[333]

The Mission:data Coalition recommended:

> two low-cost strategies that provide consumers access to: (1) their own electricity usage and pricing/charge information through interval data provided via the utility's website in standardized formats (such as Green Button "Connect My Data"), and (2) their smart meter real-time usage data. Real-time data, as noted by the ACEEE, is especially powerful in enabling achievement of the highest level of customer savings. This can be accomplished

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330 Corneli, S. and Kihm, S. (2015); *Electric Industry Structure and Regulatory Responses in a High Distributed Energy Resources Future*; Lawrence Berkeley National Laboratory Future of Electric Utility Regulation Report No. 1.

331 *Formal Case No. 1139*, Order No. 18550, Attachment A at 3-4, rel. September 22, 2016.

332 D.C. Code § 34-1504(d)(3) (Roles, duties, and powers of the Commission).

333 *Formal Case No. 1130*, Comments of U.S. General Services Administration Initial Comments at 2, filed August 31, 2015 ("GSA Initial Comments").

through enablement of the Home/Business Area Network radio in an advanced meter.[334]

In Formal Case No. 1119, the merger applicants made the following commitment: "PHI shall provide electronic data interchange ('EDI') access to historical electric usage through Pepco's Green Button capability to its customers and to customer representatives (distributed energy companies and others who a customer designates to receive such information)."[335] During evidentiary hearings in Formal Case No. 1119, PHI President and CEO David Velazquez confirmed that Green Button Connect My Data functionality will be made available to all District customers.[336]

Because matters related to access to Pepco's AMI data, including use of the Home Area Network, are under deliberation in Formal Case No. 1098, Staff can provide no further analysis or recommendation in this Report.

J. Future Evolution of the Distribution System and the Potential for DER Markets

Across the country, discussions are under way regarding the notion of restructuring the distribution system in a manner analogous to the restructuring of the transmission and generation system that has been carried out in many jurisdictions. Market participants could buy and sell energy and ancillary services at the distribution level just as they can at the bulk-electric system level in the PJM region. The idea has taken many forms under different names, like "distribution system operator" (CA) or "distribution system service provider" (NY). The common idea is that because DERs have the ability to compete with the monopoly distribution company in the provision of both energy (kWh) and capacity (kW), the incumbent electric distribution provider cannot be trusted to operate its system in a manner that is fair to potential competitors. Smarter Grid Solutions, Inc. expressed it this way:

> "The participation of DERs in electricity markets should also be considered by the Commission as a means of promoting sustainable energy via market-based mechanisms. Participation of DERs in energy markets is particularly relevant if the District considers the utility as a DSPP – as is the case in New York – or as an aggregator and integrator of DERs, as described in the recent Distribution Resources Plans submitted by Californian utilities (PG&E, SCE, and SDG&E) to the California Public Utilities Commission on July 1, 2015. Market participation of DERs enables cost-efficient providers of electricity in a given area to obtain access to those end users who need it. Market participation

334 *Formal Case No. 1130*, Mission: data Coalition Comments, at 3, filed August 31, 2015.

335 *Formal Case No. 1119*, Order No. 18160, Attachment B at 27, rel. April 4, 2016 ("Order No. 18160").

336 *Formal Case No. 1119*, Transcript of Evidentiary Hearing (December 2, 2015) at 314:4-15.

> also enables active participation of utility customers in electricity markets, which encourages sustainable generation, efficiency efforts responsive demand."[337]

There are four different pricing models for the interaction of DER customers with a regulated utility. These are summarized by Hledik and Lazar in the table below.[338]

TABLE 5: SUMMARY OF THE FOUR PRICING MODELS

Table 3. Summary of the Four Pricing Models

Pricing Model	Description
Granular Rate	A detailed, disaggregated rate in which each distribution service is priced separately and avoided through self-supply or otherwise paid for by the DER customer
Buy/Sell Arrangement	A bifurcated rate in which the DER customer pays a simple, bundled price for use of the distribution system and is separately paid for distribution services provided to the utility under a different pricing structure
Procurement Model	Utilities procure distribution services from non-regulated third parties who aggregate the services provided by individual DER customers and compensate those customers accordingly
DER-Specific Rates	A different rate is offered to each class of DER customer to reflect the costs of serving that type of customer as well as the value of the services that the specific class of DER customers provide

Another MEDSIS participant contends that "the 'regulated monopoly' business model has run its course . . . the advent of stable and functioning energy markets evolving in 2005-2010, coupled with new technologies in transmission, command and control of electrical networks, the low cost of distributed generation ("DG"), and an increase in the demand for renewable energy generation have obviated this business model."[339]

Pennoni reported that "[m]any jurisdictions around the nation are investigating or pursuing grid modernization to some extent. Several of these jurisdictions are considering a long term vision of transforming incumbent public utilities into distribution system operators ("DSOs") that would operate the distribution system for the exchange of electricity similar to the manner that independent system operators operate the transmission system."[340]

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337 *Formal Case No. 1130*, Smarter Grid Solutions Inc. Comments at 4, filed August 31, 2015.

338 Hledik, Ryan and Lazar, Jim (May 2016); Distribution System Pricing with Distributed Energy Resources; Lawrence Berkeley National Laboratory Future of Electric Utility Regulation Report No. 4 at 16. https://emp.lbl.gov/sites/all/files/feur_4_20160518_fin-links2.pdf.

339 *Formal Case No. 1130*, DC Public Power Report on Methods and Process at 2, filed November 19, 2015.

340 *Formal Case No. 1130*, Pennoni Comments to Order No. 18144, at 14, filed April 18, 2016.

The most futuristic model is known as "transactive energy" or "TE." Under TE, the electric distribution company becomes a platform for multiple markets allowing customers to sell ancillary, capacity, and energy services to each other. Rates for DER services would be market determined, not set by the Commission.

The TE model, in order to be realized, will certainly require a significant upgrading of the distribution system infrastructure. Detailed information about not only usage but also voltage and frequency at each customer's premise as well as at transformers, control devices, and other points on feeders between customers and substations will be needed in one-second intervals or less. This massive flow of data would need to be gathered, fed into operations, used to administer markets, and archived for billing. The *NARUC DER Manual* points out that "[l]ong-standing public policy on resource planning and procurement relies on long-term recovery of investments, but TE focuses on a series of short-term transactions; ensuring adequate compensation and certainty for investments will need to be proved."[341]

The U.S. Department of Energy has also offered its vision of the future electricity system.

> The grid of the future will be an essential element in achieving the broad goals of promoting affordable, reliable, clean electricity and doing so in a manner that minimizes further human contributions to climate change. To do this, the grid of the future will have to accommodate and rely on an increasingly wide mix of resources, including central station and distributed generation (some of it variable in nature), energy storage, and responsive load. It should support a highly distributed architecture that integrates the bulk electric and distribution systems. It should enable the operation of microgrids that range from individual buildings to multi-firm industrial parks and operate in both integrated and autonomous modes.
>
> The grid of the future should be supported by a secure communication network — its information backbone — that will enable communication among all components of the grid, from generation to the customer level, and protect the system from cyber intrusions.
>
> In short, the grid of the future should seamlessly integrate generation, storage, and flexible end use. It should promote greater reliability, resilience, safety, security, affordability, and enable renewable energy, while achieving better economic and

[341] *Distributed Energy Resources Rate Design and Compensation: A Manual Prepared by the NARUC Staff Subcommittee on Rate Design*, at 141 (November 2016). http://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0.

> environmental performance, including reductions in greenhouse gas (GHG) emissions. It will require business models and regulatory approaches that sustain grid investment and continued modernization while at the same time allow for innovation in both technologies and market structures.[342]

Communication and distribution generation technologies are evolving rapidly and the realization of some variation of distribution system restructuring at some point in the future cannot be ruled out.[343] However, there are numerous variations of the underlying restructuring model and many important questions that would need to be addressed in the District of Columbia context.

The core technical challenge at the heart of the DOE's vision is the two-way flow of electricity on the distribution system that is managed by a two-way flow of information. In the transactive energy model, a two-way flow of money is added. The information communication and storage requirements are substantial. Whether – and to what extent – Pepco's existing AMI infrastructure could be integrated into this vision for an advanced distribution management system or would need to be replaced remains an open question.

Securing the "grid of the future" may also add cost. The National Institute for Standards and Technology ("NIST") leads efforts to develop cyber security standards and NIST has given special attention to electric-sector modernization. NIST contends that progress towards "an advanced, digital infrastructure with two-way capabilities for communicating information, controlling equipment, and distributing energy" must have as a priority "devising effective strategies for protecting the privacy of smart grid-related data and for securing the computing and communication networks that will be central to the performance and availability of the envisioned electric power infrastructure. While integrating information technologies is essential to building the smart grid and realizing its benefits, the same networked technologies add complexity and also introduce new interdependencies and vulnerabilities. Approaches to secure these technologies and to protect privacy must be designed and implemented early in the transition to the smart grid."[344]

K. Conclusion

The economics of utility regulation are fundamental to any discussion of energy delivery system modernization and the future of distributed energy resources. The pace of DER adoption is dependent upon the economic policies, statutes, and regulations governing the energy delivery

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342 *Quadrennial Energy Review Report: Energy Transmission, Storage, and Distribution Infrastructure*, U.S. Department of Energy, at 3-4 (April 2015).

343 *See* De Martini, Paul and Kristov, Lorenzo, Distribution Systems in a High Distributed Energy Resources Future: Planning, Market Design, Operation and Oversight, Lawrence Berkeley National Laboratory Future of Electric Utility Regulation Report No. 2, (October 2015). https://emp.lbl.gov/sites/all/files/FEUR_2%20distribution%20systems%2020151023_1.pdf

344 *Guidelines for Smart Grid Cybersecurity*, NISTIR 7628 Revision 1, at 6 (September 2014). http://dx.doi.org/10.6028/NIST.IR.7628r1.

systems those DERs interconnect with. In other words, the rates and tariffs paid by the utility for DER services and the terms on which DERs can offer services to other distribution system customers will influence the financial viability of DER investments.

The discussion and analysis of economic issues in this Staff Report is abbreviated due to the number of open regulatory proceedings and the legal designation of the Commission Staff as advisory rather than independent. However, after the issuance of final orders in Formal Case Nos. 1137 and 1139, Staff will, if necessary, provide the Commission with updated recommendations related to these issues.

VII. PROPOSED MEDSIS GRANT FUNDING PARAMETERS & PROPOSED DEMONSTRATION PROJECTS

A. Background

This section provides an overview of a preliminary framework, competitive process, and timeline for achieving the objectives of the MEDSIS Pilot Project program.

As a result of the PHI-Exelon Merger approved by the Commission in Order No. 18148 on March 23, 2016, a $21.55 million MEDSIS Pilot Project Fund Subaccount was created and the funds therein were directed to be used to support pilot projects related to energy delivery system modernization under consideration in Formal Case No. 1130.[345] Paragraph 5 of the Merger Commitments states:

> Within sixty (60) days after Merger close, Exelon shall provide funding in the amount of $21.55 million to the Formal Case No. 1130 MEDSIS Pilot Project Fund Subaccount within the Formal Case No. 1119 Escrow Fund. The fund shall be held in escrow until the Commission approves a pilot project and directs that the funds be released.[346]

As of May 20, 2016, Pepco established and funded the Formal Case No. 1119 Escrow Fund pursuant to Paragraph 4 of the Merger Commitments.[347] On the same date, Pepco executed an Escrow Agreement with a bank that will serve as Escrow Agent. The amounts in question have been irrevocably deposited, are held in trust by the Escrow Agent, and are recorded on Pepco's balance sheet as "restricted cash and cash equivalents." Pursuant to the Escrow Agreement terms, the Commission will approve the disbursements of any funds from the MEDSIS Pilot Project Fund Subaccount currently held in escrow.

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345 *Formal Case No. 1119*, Order No. 18148, rel. March 23, 2016.

346 *Formal Case No. 1119*, Order No. 18160, Attachment B, ¶ 5, rel. April 4, 2016.

347 *Formal Case No. 1119*, Order No. 18160, Attachment B, ¶ 4, rel. April 4, 2016. At the same time, Pepco also created the Energy Efficiency and Energy Conservation Initiatives Fund Subaccount pursuant to Order No. 18160, Attachment B, ¶ 7(a), funded in the amount of $11.25 million.

As part of Formal Case No. 1130, the Commission asked Staff to consider what parameters and procedures could be applied to Pilot Projects requesting MEDSIS grant funding. Below, Staff provides suggested parameters and points of consideration pertaining to the approval of Pilot Projects funded by the MEDSIS Subaccount.

B. MEDSIS Pilot Projects

The MEDSIS Pilot Project Fund is a tool to further the goal of the MEDSIS proceeding "to identify technologies and policies that can modernize our energy delivery system for increased sustainability and will make our system more reliable, efficient, cost-effective and interactive."[348] The MEDSIS Pilot Project Fund will require a cooperative framework for the local distribution companies to work with third parties, with oversight by the Commission, to plan for and demonstrate technologies that will modernize and improve the energy distribution systems in the District of Columbia. That cooperative framework will ensure that (1) distribution companies support innovative projects, and (2) any interconnection and related costs for regulated utilities are made explicit. Staff recommends that interconnection costs be recovered in full from the Pilot Project entity, consistent with current Small Generator Interconnection Rules.

Staff recommends that the MEDSIS Pilot Project Fund provide grants for "pilot projects," in which a small-scale trial is used to determine whether a larger application is worthwhile and "demonstration projects," in which regulatory agencies waive particular regulatory requirements and evaluate the results. A MEDSIS project may combine elements of these two types of projects, as there may be promising or commercially viable technologies and systems that are deterred by existing regulations, regulatory uncertainty, funding challenges, risk, and or business plan uncertainty. Well-designed resource potential studies can produce valuable information to support market expansion.

Staff recommends that consideration be given to identifying policy priorities for Pilot Project applicants. Pilot Projects eligible for MEDSIS grants could include, but are not limited to, the following types of distributed energy resources ("DER"): advanced control systems, cogeneration systems, demand management, electric vehicles, energy storage, fuel cells, microgrids, photovoltaic systems ("PV"), smart inverters, voltage regulation, and district heating and cooling. For example, such priorities could include demonstrating the value of smart inverters or identifying opportunities for cogeneration projects.[349] The Commission should also prioritize evaluating outcomes and lessons learned through every stage of the programs. The

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[348] *Formal Case No. 1130*, Order No. 17912, ¶ 1, rel. June 12, 2015.

[349] For a list of suggested MEDSIS Pilot Projects, see *Formal Case No. 1130*, Comments of the Grid 2.0 Working Group, DC Climate Action, DC Environmental Network, and Chesapeake Climate Action Network, at 3-6, filed July 25, 2016.

Fund may also support projects that address planning, integration, or interconnection issues related to higher levels of DER penetration in the District.[350]

Staff recommends that three types of projects not be eligible for MEDSIS Pilot Project grant funding. First, MEDSIS grants should not be used to test unproven technologies; the Commission relies on the federal energy labs and academia to take the lead on research and development. Second, energy efficiency programs should be excluded from eligibility for MEDSIS Pilot Project grants because funding for such programs is available under the Energy Efficiency and Energy Conservation Initiatives Fund Subaccount or through the SEU which also manages many energy efficiency programs. Third, projects proposed and lead by unregulated subsidiaries and affiliates of regulated utilities should not be eligible for MEDSIS Pilot Project grants.

Staff also recommends that an optimal selection of projects move forward based on a cross section of DER technologies. Projects currently planned or under development in the District of Columbia should be eligible to apply. Staff recommends that the size and financial wherewithal of applicants be considered to ensure that MEDSIS Pilot Project grant funds are directed towards worthy projects in need of support. Furthermore, Staff recommends that the benefit a broad cross section of District residents and that the public interest is advanced.

C. MEDSIS Pilot Project Grant Funding Sample Qualification Parameters

When submitting proposals for Pilot Projects funded by the MEDSIS Subaccount, Applicants may be asked to discuss their qualifications based upon a set of parameters. Staff has put forward sample parameters below (See Table 6). These preliminary parameters are intended for use in MEDSIS Grant Funding Phases One, Two, and Three (as described in Section D below).

TABLE 6: MEDSIS PILOT PROJECT GRANT FUNDING QUALIFICATION PARAMETERS

MEDSIS Pilot Project Grant Funding Qualification Parameters	
I	**Type and Purpose of the Pilot Project**

1. Description of the proposed Pilot Project.
    a. How will the Pilot Project help modernize an energy delivery system in the District of Columbia?
    b. How much energy and/or demand capacity will the Pilot Project provide?
    c. Does the Pilot Project envision selling energy generated in excess of the site's own needs? If so, to who would it be sold and how would the resulting revenue be used?
2. Ownership and management structure of the Pilot project.
    a. Will the Pilot Project be owned by a regulated utility, public agency, private, or non-profit entity during the Pilot Project phase?
    b. Who will operate the proposed project on an ongoing basis?
    c. If a proposed Pilot Project is utility-owned, what other ownership and operational structures, including third-party participation or service provider options, were explored and why were they rejected?

[350] Additionally, the MEDSIS Pilot Project program will further clarify the relationship between these types of projects and the regulated utilities, including any interconnection-related requirements.

MEDSIS Pilot Project Grant Funding Qualification Parameters

3. Will the Pilot Project provide service to the general public or a more limited group of customers?
   a. How many ratepayers are estimated to benefit from this Pilot Project?
   b. Does this Pilot Project serve a single or multiple electric distribution rate classes or none?
   c. Does the Pilot Project provide employment opportunities for District residents and or businesses? (Both short-term construction and on-going jobs.)

II Reputation & Track Record of Applicants

1. The Applicant requesting funding must provide ample references for their business experience.
2. The Applicant must provide details of their experience relevant to the proposed project, including but not limited to, implementing DER facilities on a similar scale.
3. Is the Applicant, or any subcontractors, certified by the Office of Local Business Development ("OLBD") in the District Government as Certified Business Enterprises ("CBE") and Businesses in an Enterprise Zone?
4. Are any unregulated subsidiaries or affiliates of utilities regulated by the Public Service Commission involved directly or indirectly in the Applicant's proposal?

III Project Funding Plan

1. How much MEDSIS grant funding is requested?
2. Will private financing for components of the Pilot Project be sought?
3. Please explain whether any District or Federal government funding opportunities are available for the type of project being proposed. If so, have they been pursued?
4. What are the project funding requirements by source and use, by quarter and year?

IV Environmental Benefits

1. Is the Pilot Project a clean or renewable energy source?
2. What will be the short-term and long-term environmental impact of the Pilot Project on the following:
   a. Greenhouse gas emissions (carbon dioxide, methane, and other types)
   b. Aesthetic impact
   c. Air pollution emissions
   d. Nuisance emissions
   e. Environmental justice concerns.
3. How does the Pilot Project advance the District's Sustainable Energy Goals?[351]
4. The Applicant should address the following site selection considerations:
   a. Planning and permitting
   b. Public input
   c. Coordination with emergency management
   d. Historic preservation issues (if any).

V Interconnection Considerations

1. Does the Pilot Project require interconnection to the electric distribution system?
   a. Does the Pilot Project meet existing criteria established by the electric distribution utility for interconnection?
   b. Are there concerns related to the interconnection of the proposed technology into the electric distribution system? If so, what are those concerns and how will they be mitigated?

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351 *See Sustainability DC* (2012) at http://www.sustainabledc.org/wp-content/uploads/2012/10/SDC-Final-Plan_0.pdf.

MEDSIS Pilot Project Grant Funding Qualification Parameters

c. Have similar technologies been interconnected in the District of Columbia or elsewhere?

2. How does the Pilot Project fit into the corresponding utilities' (WGL or Pepco) long-term plans for the energy delivery system?
    a. Provide both short- and long-term impact analyses.
    b. Does the proposed location of the Pilot Project provide added benefit to ratepayers or the energy delivery system based on identified system weaknesses and or forecasted load needs?
    c. Do the project benefits include deferral of distribution system capital expenditures?

VI PJM Interconnection

1. Will PJM have operational visibility of the Pilot Project during operation?
2. Will the Pilot Project participate in PJM's organized markets?
3. Please describe any known FERC regulatory requirements that must be met by the proposed Pilot Project.

VII Commission Oversight

1. How will Commission oversight of the Pilot Project be ensured?
2. What waivers from existing Commission rules are being requested?
3. What reporting and evaluation strategy (e.g., Evaluation, Measurement and Verification protocols) are proposed to measure outcomes of the Pilot Project?
    a. Does the Applicant agree to publicly disclose financial information related to the Pilot Project so that the Commission and the public can gauge its success in isolation as well as compared to similar existing and proposed projects (i.e., total costs and revenues).
    b. Proposed timelines for project and all reports and evaluations.
4. How does the Applicant propose to handle disputes between the Applicant and the utility and or the Applicant and consumers?
5. What safety requirements, compliance measures, and consumer protections is the Applicant proposing?
    a. Detail safety and maintenance measures
    b. Consumer protection and retail choice requirements, if applicable[352]
    c. Community and industry educational development and planned outreach

VIII Public Interest Determination

1. To assess whether the Pilot Project is in the public interest, the Applicant must address the following factors:
    a. How will the proposed project increase reliability?
    b. How will the proposed project increase resiliency?
    c. How will the proposed project lower electric or gas bills for some or all ratepayers?
    d. Will the proposed project be cost effective over its expected life?
    e. How will it provide useful information that will further the energy system modernization goals?[353]
    f. How will it advance District of Columbia energy and sustainability goals?[354]

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[352] 15 DCMR §§ 300-399 - Consumer Rights and Responsibilities.

[353] It is the goal of the MEDSIS proceeding "to identify technologies and policies that can modernize our energy delivery system for increased sustainability and will make our system more reliable, efficient, cost-effective and interactive." *Formal Case No. 1130*, Order No. 17912, ¶ 1, rel. June 12, 2015.

MEDSIS Pilot Project Grant Funding Qualification Parameters

g. What other societal and environmental benefits will the proposed project provide?

IX Risk Management

1. How will the following types of risks be managed?
   a. Operational
   b. Construction
   c. Financial.
2. Describe the property and liability insurance coverage that will be in place for the Pilot Project.
3. Identify all regulatory waivers or exemptions needed to complete the Pilot Project.

X Enabling Contracts

1. Provide the status, description and copy of each contract needed to enable the Pilot Project, including the following:
   a. Power purchase agreements
   b. Design, engineering, and construction contracts
   c. Operating contracts
   d. Memoranda of understanding
   e. Financing agreements
   f. Siting permit requirements
   g. Environmental permitting
   h. Material lease agreements
   i. Site acquisition contracts.
2. Describe the reasonable and customary procurement processes employed to ensure fair and open competition.

XI Economic & Fiscal Impacts

1. Provide estimates of the property, sales, and other District tax revenue the project will generate during construction and operation for the first three years.
2. Describe the employment and business opportunities the project will create in the District.
3. Identify which District Wards and neighborhoods will benefit and how.

XII Impacts on the Obligation to Serve & Public Safety Responsibilities

1. Describe how the Pilot Project will ensure the provision of reliable electric or gas service to District customers.
2. Will the Pilot Project share the obligation to serve with another entity?
3. Explain how customers will receive electricity if the Pilot Project does not operate.
4. Describe the measures that will be in place to ensure the safety of the public.

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[354] *See Sustainability DC* (2012) at http://www.sustainabledc.org/wp-content/uploads/2012/10/SDC-Final-Plan_0.pdf. See also DOEE's *Clean Energy DC* (November 2016).

D. MEDSIS Pilot Project Grant Funding Process & Timeline

Staff recommends that the Commission solicit projects, using a standardized RFQ/RFP process and timeline. The information noted below is Staff's proposal for a representative framework that would allow the Commission to execute the selection of pilot projects in a disciplined, transparent, systematic, and robust manner. Features of this framework have been deployed in other successful pilot projects across the industry. It is anticipated that Pilot Project grants will be awarded progressively over time as milestones are achieved.

TABLE 7: MEDSIS PILOT PROJECT GRANT FUNDING PROCESS & TIMELINE

MEDSIS Pilot Project Grant Funding Process & Timeline
PHASE ONE: Request for Qualifications (RFQ)
The governing body coordinates preparation of the RFQ, issues the RFQ, and evaluates responses. The RFQ will be based on parameters approved by the Commission. The RFQ process has been proven to be an efficient way to screen out unqualified applicants. Successful written applications should describe how the Pilot Project advances the MEDSIS goals, provides benefits for the District of Columbia and involves local partners. Applicants should describe their technical, operational, and financial track record. Applicants should also explain whether they, or any proposed subcontractors, are certified by the Office of Local Business Development (OLBD) in the District Government as Certified Business Enterprises (CBE) and Businesses in an Enterprise Zone. Staff will prepare the RFQ based on the parameters approved by the Commission. Qualified applicants will be eligible to receive funding for a feasibility study in the subsequent phase. ➢ Timeline: Three months. ➢ MEDSIS budget subtotal: Costs will be paid by applicants.
PHASE TWO: Feasibility Study Development & Completion
To ensure maximum participation, MEDSIS will fund commercial Feasibility Studies for up to \$150,000 each for selected applicants qualified in Phase One. Unproven technologies will be excluded (as noted) and applicants must provide a funding plan showing sources of funds and planned expenditures. Applicants can use their completed Feasibility Study to pursue private and public funding to match MEDSIS resources in the subsequent phases. The governing body will prepare minimum requirements for the Feasibility Studies that will include planning for business viability. The governing body will review the results of the Feasibility Studies and create a list of vetted projects eligible to be considered for further funding. ➢ Timeline: Up to six months. ➢ MEDSIS budget subtotal: Up to \$3 million for all funded Feasibility Studies (for the maximum amount, 20 projects could be funded at this stage).
PHASE THREE: Project Selection
The governing body will make recommendations to the Commission on which projects will advance to the next stage. ➢ Timeline: Three months.
PHASE FOUR: Design & Engineering
MEDSIS will provide partial funding for the cost of engineering, design, related IT – software and hardware development/design expenditures, including communication systems. The majority of such costs will be funded by the Applicant, its partners, and other sources. The applicant should also update the project business plans as required. Intellectual property protections may be needed during this phase.

MEDSIS Pilot Project Grant Funding Process & Timeline

- Timeline: Up to six months.
- MEDSIS budget subtotal: Up to $5-7 million for projects funded in this phase (number of funded projects depends on types of projects, capital intensity, scale, and availability of other funding).

PHASE FIVE: Siting, Permitting, & Construction

MEDSIS will provide funding for the cost of siting, permitting, and building the Pilot Project, including related IT-software/hardware system and communication system expenditures. Consideration will also be given to the need to provide some limited business model gap funding to help bring pilots to fruition. The majority of such costs will be funded by the Applicant, its partners, and other sources. Ongoing operating and maintenance costs will be the sole responsibility of the Applicant. The applicant should also update the project business plan as required.

- Timeline: Up to six months.
- MEDSIS budget subtotal: Up to $10-12 million for all build projects funded (number of funded projects depends on level of cost sharing achieved).

Procedures will be established for the ongoing monitoring, reporting, and evaluation of all MEDSIS Pilot Projects in development and after completion. The selection process will be structured to yield a minimum of six to 10 projects at Phase Five (as described above). Each Pilot Project will be required to provide annually an updated schedule with milestones, cost estimates, and a budget forecast of MEDSIS funding requirements in Phases Four and Five. MEDSIS-funded entities must demonstrate use of prudent and competitive contracting procedures.

In the furtherance of its fiduciary obligation, Staff recommends that the Commission publish an annual financial report, as a part of the "Annual MEDSIS Status Report," that includes a full reconciliation of all MEDSIS funds received and spent by each Pilot Project (See Table 13). The Commission will reserve the right to conduct independent audits or reviews on all funded projects.

Staff is open to suggestions from the public as to how the pilot projects approved for MEDSIS funding should be selected. Staff recommends, as one option for consideration, that an independent board, similar to the Smart Meter Pilot Program, Inc. ("SMPPI") board,[355] be formed and directed to evaluate the pilot applications using the finalized parameters from this Report, which will incorporate public comment. After reviewing all of the applications submitted using the finalized parameters as a guide, the board could draft a report detailing how each project selected complies with the parameters and why the ones selected are the most

355 The Smart Meter Pilot Program, Inc., ("SMPPI") was a nonprofit corporation established with a $2 million contribution from Pepco in the Connectiv Merger settlement approved by the Commission on May 1, 2002 through Order No. 12395. The SMPPI board included Pepco, the Office of the People's Counsel, the Consumer Utility Board, IBEW Local 1900; and the Commission. *See Formal Case No. 1002,* In the Matter of the Joint Application of Pepco and the New RC, Inc. for Authorization and Approval of Merger Transaction, Order No. 13570, rel. May 3, 2005.

appropriate for MEDSIS funding. The board could then submit their report and the projects that they recommend be selected to the Commission for final approval.

The board could also provide a thorough analysis of the proposed MEDSIS funding relationship and contractual requirements between the Commission and the funding recipients. A related task is preparation of a model agreement (*e.g.*, letter of intent, memorandum of understanding, etc.) governing the relationship between the Commission and the MEDSIS-grant-funded entities setting forth the rights and obligations of both parties, including indemnification clauses. Alternatively, Commission Staff could make the recommendations as to which pilots should be approved by the Commission with assistance from an independent consultant.

Regardless of how the selection process is structured, Staff recommends that program start-up and recurring administrative costs be paid for by a combination of prudent disbursements from the Pilot Project Escrow Account and the Commission's operating budget. All payments for approved expenditures from the MEDSIS Subaccount will be made at the direction of the Commission and in accordance with the Escrow Agreement.

Staff will continue to review and assess the progress made in other jurisdictions that have similar pilot programs with the goal of identifying best practices and lessons learned as the MEDSIS Pilot Project effort unfolds.

Staff recommends that the Commission hold a MEDSIS Town Hall to garner public comment on the Proposed MEDSIS Grant Funding Parameters and Demonstration Projects. Staff recommends that the Town Hall be narrowly tailored to elicit public comment on the proposals discussed in this section of the Report, including but not limited to: the proposed governance structure, pilot project parameters, funding mechanisms, project selection criteria, and timelines for selecting projects. Staff recommends that the MEDSIS Town Hall be held within 40 days of issuance of this Report – well before the initial comments on the entirety of the MEDSIS Staff Report are due.

VIII. CONCLUSION & IMPLEMENTATION TIMETABLE

This MEDSIS Staff Report explains how the Commission can realize the goals of modernizing the energy delivery systems in the District within our statutory charge to ensure that safe, reliable, and affordable energy service is provided to District ratepayers. Staff has endeavored to provide an initial discussion to move the initiative forward by focusing on updating regulations that could hinder energy system modernization in the District as well as providing a preliminary framework for achieving the objectives of the MEDSIS Pilot Project program.

Staff recognizes that this is just the first step in a multi-year process. Additional efforts will be required, like adapting other Commission regulations, reviewing rate design issues, and considering appropriate tariffs. As indicated in this Report, several of those issues are entangled in the open base rate proceedings initiated by the electric and gas distribution companies. Once those proceedings have concluded, Staff recommends that MEDSIS move forward to engage the public and the entire stakeholder community in a new phase of public workshops. However, with this MEDSIS Report, Staff has tried to both address immediate issues as well as set the stage for addressing these more long-term issues in the future.

To that end, below Staff provides an Implementation Timetable which takes each Recommended Action ("RA") found in this Report and provides the next step to address the RA as well as the target completion date for implementing the RA. Staff notes that most of the RAs provided in this Report relate to regulatory changes needed to facilitate MEDSIS. These regulatory changes will be achieved by the Commission issuing Notices of Proposed Rulemakings ("NOPRs") and following the Commission's well-established notice and comment procedures for the adoption or amendment of regulations. The public can provide comment on the draft NOPRs attached to this Staff Report at Appendices E and F in conjunction with comments filed on the entirety of the Staff Report.

Furthermore, in Section VII of this Report, Staff has provided a preliminary framework for the MEDSIS Pilot Project program on which Stakeholders should also provide comment. As indicated in the Implementation Table below, comments on the entirety of the MEDSIS Staff Report, including the MEDSIS Pilot Project section are due 60 days after the date of the Report's issuance and reply comments are due 30 days thereafter.

Additionally, District law allows the Commission to declare components of distribution service to be competitive services (See the discussion in Section I.B.2 – "The District's Restructured Energy Market"). If a Stakeholder believes a specific service is a competitive service, then they should petition the Commission to declare it as such and provide support for the Commission making such a finding by addressing the required factors found in D.C. Code § 34-1504(e).

Staff encourages stakeholders and the public to remain engaged in the MEDSIS Initiative as it evolves because broad input from diverse sources has been, and will continue to be, crucial to ensuring that the rules adopted and decisions made by the Commission on the issues related to modernizing the District's energy systems are well-informed and thoroughly scrutinized. Staff is committed to maintaining a transparent process, where interested persons are provided an opportunity to comment on MEDSIS-related matters, like this Staff Report, the MEDSIS Pilot

Projects process, and the draft NOPRs attached to this Report, before official action is taken by the Commission. Therefore, Staff has recommended additional public participation methods, like holding a MEDSIS Town Hall on the Proposed MEDSIS Grant Funding Parameters and Demonstration Projects discussed in Section VII of this Report before initial comments are due.

Lastly, as the MEDSIS Initiative progresses, Staff will continue to monitor related proceedings in other jurisdictions and Staff recommends that the Commission remain dedicated, to the extent appropriate, to working with the District Government and other agencies to achieve the District's energy goals.

TABLE 8: IMPLEMENTATION TIMETABLE

Implementation Timetable			
Regulatory Changes			
Item	**Recommended Action**	**Task**	**Target**
1.	Issue a Notice of Proposed Rulemaking to Adopt Definition of Distributed Energy Resource	Issue NOPRs within 60 days of receiving comments on the draft NOPRs attached to this Report at Appendix E	Initial comments on NOPRs due 30 days after issuance and Reply comments due 15 days later Issue Notice of Final Rulemakings (NOFRs) within 45 days of receiving reply comments
2.	Issue Notice of Proposed Rulemakings to Adopt Definitions for the Various Types of Distributed Energy Resources		
2.a	Issue a Notice of Proposed Rulemaking to Adopt Definition of Distributed Generation		
2.b	Issue a Notice of Proposed Rulemaking to Adopt Definition of Fossil fuels		
2.c	Issue a Notice of Proposed Rulemaking to Adopt Definition of Cogeneration systems		
2.d	Issue Notice of Proposed Rulemaking to Adopt Definition of Fuel Cells		
2.e	Issue Notice of Proposed Rulemaking to Adopt Definition of Microturbines		
2.f	Issue a Notice of Proposed Rulemaking to Adopt Definition of Behind-the-Meter Generator		
2.g	Issue a Notice of Proposed Rulemaking to Adopt Definition of Net Energy Metering Facilities		
2.h	Issue a Notice of Proposed Rulemaking to adopt Definition for Energy Storage		
2.i	Issue Notice of Proposed Rulemaking to Adopt Definition of Batteries		
2.j	Issue Notice of Proposed Rulemaking to Adopt the Definition of Electric Vehicles found in D.C. Code § 50-1501.01 (12)		

Implementation Timetable			
2.k	Issue Notice of Proposed Rulemaking to Adopt Definition of Fly-wheels		
2.l	Issue Notice of Proposed Rulemaking to Adopt Definition of Demand Response		
2.m	Issue Notice of Proposed Rulemaking to Adopt Definition of Microgrids		
3.	Issue a Notice of Proposed Rulemaking to Adopt a New Rule to Streamline Renewables Facility Approvals to within 20 days	Issue NOPRs within 60 days of receiving comments on the draft NOPRs attached to this Report at Appendix F	Initial comments on NOPRs due 30 days after issuance and Reply comments due 15 days later Issue Notice of Final Rulemakings (NOFRs) within 45 days of receiving reply comments
4.	Issue a Notice of Proposed Rulemaking to adopt a definition of "Electrical Company" that clarifies that the term expressly excludes any person or entity distributing electricity from a behind-the-meter generator to a single retail customer behind the same meter.	Issue NOPRs within 60 days of receiving comments on the draft NOPRs attached to this Report at Appendix E	Initial comments on NOPRs due 30 days after issuance and Reply comments due 15 days later Issue Notice of Final Rulemakings (NOFRs) within 45 days of receiving reply comments
5.	Issue Notice of Proposed Rulemaking to Amend the Definition of "Electricity Supplier"		
6.	Initiate Pilot Programs Funding process pursuant to § VII of this Staff Report	Pursuant to direction from the Commission, the Pilot Project Parameters shall be released for Comment. After the parameters are finalized, the Commission should issue RFQs to obtain project submissions that comport with final parameters.	RFQ(s) issued within 90 days of issuance of the Final Order on this Staff Report

Implementation Timetable		
Additional Recommended Actions –		
Item	**Recommended Action**	**Target**
1.	Issue MEDSIS Staff Report for public comment with an extended comment and reply comment periods. Staff recommends seeking comment on the entirety of MEDSIS Report, but specifically the Proposed MEDSIS Funding Parameters (Section VII).	Initial comments due 60 days after issuance of MEDSIS Staff Report and reply comments due 30 days thereafter
2.	After the issuance of Final Orders in Formal Case Nos. 1137 (WGL rate case) and 1139 (Pepco rate case), Staff should provide updated recommendations to the Commission on any issues implicated in this proceeding that have been tabled in this Report pending final orders.	90 days from the issuance of a final order in FC1137 and FC1139
3.	After the issuance of Final Orders in Formal Case Nos. 1137 (WGL rate case) and 1139 (Pepco rate case), open an Investigation into the utility's obligation to serve (Standby Rates) under various DER structures. Staff could form a working group to analyze the responsibility of the utility, provider, and customers.	90 days from the issuance of a final order in FC1137 and FC1139
4.	Hold a Town Hall meeting to garner public comment on Section VII of the Staff Report. More specifically, the proposed governance structure, pilot project parameters, funding mechanisms, project selection criteria, and timelines for selecting projects.	Within 40 days of issuance of MEDSIS Staff Report
5.	Monitor MEDSIS Initiatives in other jurisdictions, especially PHI jurisdictions, and leverage pending and completed studies from stakeholders	On-going
6.	Monitor and participate in on-going Stakeholder forums including, but not limited to: • Utility-sponsored sessions on DER: Maintaining Reliability & Integrating New Technology; Green Power Connection Solar Stakeholder Collaboratives and Webinars • MDV-SEIA, National Town Meetings on Smart Grid; Solar Electric Power Association meetings	On-going
7.	The Commission should issue an "Annual MEDSIS Status Report" to account for the progress of the MEDSIS Initiative, including but not limited to: (1) outlining lessons learned, status of proposed rulemakings and legislative changes, and other proposed actions to move the MEDSIS Initiative forward; (2) detail work completed, goals reached, and projects approved in the prior year as well as planned or approved for the coming year(s); (3) provide an accounting of the MEDSIS Pilot Project Fund, including fund balances, disbursements made in the year, and planned disbursements for the coming year(s). The "Annual MEDSIS Status Report" should be issued for public comment and included as a section in the Commission's Annual Report to Council.	Beginning in 2018

The Final Order issued on this Staff Report should include an updated Implementation Timetable that reflects the recommendations actually accepted by the Commission and any other Commission specific directives.

APPENDIX A - CONSUMER CHOICE & EMERGING TECHNOLOGIES

The role of the District's energy distribution system is evolving with changes in available technologies and shifts in consumer preferences.[356] District policies, including policies to propel adoption of more clean generation, provide guidance to the Commission on the District's short and long-term energy needs. The Commission is being forward looking and proactive in this modernization initiative, which will allow it to better accommodate the Commission's overall mission and the public interest as the District moves towards a modern, reliable, resilient, and cost-considerate energy distribution system, while simultaneously fostering competition and maintaining the financial health of the District's utilities. Based on this goal, Staff briefly discusses current changes in consumer preferences and emerging technologies in the energy sector that may impact the MEDSIS Initiative.

A. Consumer Choice

The country is aging while the District is getting younger. According to the U.S. Census Bureau, the median age in the District of Columbia decreased from 34.3 in 2010 to 33.7 in 2015 while the total population rose by more than 10 percent.[357] All consumers, including many younger consumers, display changing expectations and preferences. Many consumer services have increased the level of interaction with service providers, optionality in acquiring services, and a voice in choosing the types and environmental characteristics of the service they consume. A corresponding emergence of new delivery models, including peer-to-peer marketplace businesses (ex. UBER, Airbnb, EBay, *etc.*), is blurring the boundary between consumer and producers. Many consumers also increasingly prefer organic, green, and local choices as well as clean energy sources.[358]

Recent changes have come on top of earlier ones. From 1913 through the year 2000, Pepco was the sole electric utility company serving the District regulated by the Commission. In 1999, the D.C. Council passed the Retail Electric Competition and Consumer Protection Act of 1999 ("1999 Act"), authorizing the Commission to consider a Pepco request for approval to sell its generation plants and open the retail generation market to competition.[359] Similarly, the Retail Natural Gas Supplier Licensing and Consumer Protection Act of 2004 ("2004 Act")," was enacted with a purpose of opening access to the gas distribution system in a similar manner as the 1999 Act had for the electricity market. While consumer preference trends are changing, the

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356 Paul De Martini and Lorenzo Kristov, *Distribution Systems in a High Distributed Energy Resources Future: Planning, Market Design, Operation and Oversight* pg. 14-17, https://emp.lbl.gov/sites/all/files/lbnl-1003797_presentation.pdf

357 U.S. Census Bureau; American Community Survey 5-Year Estimates; https://www.census.gov/programs-surveys/acs/. "Median age" means that one half of the population is older and the other half is younger.

358 *Actionable Insights for the New Energy Consumer: Accenture End-Consumer Observatory 2012*, Accenture, pgs. 12-14 https://www.accenture.com/_acnmedia/Accenture/next-gen/insight-unlocking-value-of-digital-consumer/PDF/Accenture-Actionable-Insights-New-Energy-Consumer.pdf.

359 Retail Electric Competition and Consumer Protection Act of 1999, D.C. Law 13-107, enacted May 8, 2000.

utility industry remains predicated on a regulated monopoly for distribution service – with District energy suppliers competing for retail customers.

As asserted by Lawrence Berkeley National Laboratory, "[a]s the grid becomes increasingly digital and distributed, customization of services for electricity customers will continue to grow. Large commercial customers, for example, increasingly want renewable energy to meet their corporate sustainability goals; cities and towns are requesting customized services, such as help with microgrids, smart city services or renewable energy; and some residential customers want greater control over their energy use and/or renewable power or private rooftop solar to generate their own electricity. But some customers simply want plain vanilla electricity at an affordable price."[360]

The Berkeley Lab Report goes on to assert that "[a]lthough these megatrends are driving change, the speed of transformation to a great extent will depend on whether regulation evolves to accommodate these changes. The business model of electric utilities must change to reflect the changing generation mix. At the same time, the grid is more complex and customers have different expectations and needs, meaning that the regulatory model must also change. The utility business model can only change to the extent that regulation adjusts to facilitate these changes."[361] Staff believes that this is a key point and driver of the MEDSIS Initiative, namely to make sure that the Commission is doing its part to ensure that the regulatory system is not hindering development of the utility business model and market access which can foster grid modernization.

Staff also agrees that "[o]ver the next decade, regulation will have to provide a way for utilities to achieve new corporate and policy goals that meet the needs of their customers. That means meeting the traditional goals of providing safe, reliable and affordable electricity, as well as the new goals of providing even cleaner electricity and individualized customer services, while integrating and connecting more distributed energy resources and devices."[362]

B. Competition

Competition is an important value in our society and we all benefit from it on a daily basis. Most of the goods and services that we use and enjoy are sold to us in markets that are more or less competitive. As a result, new suppliers are allowed to enter a market if they can provide the good or service more cheaply and thereby take market share from established businesses.

For example, telephone service was once a regulated monopoly but technological changes like wireless phones and the Internet turned the old regulatory model upside down. More recently, new transportation services like UBER and Lyft have "disrupted" regulated taxicab service in many localities around the country. The possibility has emerged that technological change –

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360 Lisa Schwartz, Lisa Wood, John Howat, *et al*, *Recovery of Utility Fixed Costs: Utility, Customer, Environmental and Economist Perspectives*, Future Electric Utility Regulation, Lawrence Berkeley National Laboratory LBNL-1005742, Report No. 5, at 14 (June 2016) ("Berkeley Lab Report No. 5").

361 Berkeley Lab Report No. 5, at 14.

362 Berkeley Lab Report No. 5, at 14.

including DERs – could also bring about a radical restructuring of the regulated monopoly in electric distribution service.

Safety, reliability, universal service, and affordability are also important values to society. These values have been well-served under the established system of utility regulation. Electric power is inherently dangerous; so safe application requires careful standards-setting, operation and maintenance, and system planning. The demand for reliability in distribution service grows daily, as society becomes ever more dependent on electronic devices in all aspects of our daily lives.

Herein lays the challenge for citizens, legislators, and regulators. Can competition be introduced into local electric *distribution* service without undermining safety, reliability, universal service, or affordability?

Driven by powerful forces of technological change that are forcing down costs rapidly, the revolution in distributed energy cannot be considered a passing fad. Customers who want to be able to take advantage of the benefits of DER ought to be able to do so without being deterred by prohibitive interconnection costs or other requirements imposed by the monopoly distribution service provider. At the same time, because the electric distribution company is a <u>regulated</u> monopoly, it is possible that the regulated rate system itself can be tilted in favor of some or all DER's. Any time costs are imposed on non-DER customers to support further DER deployment, we should consider whether or not the "monopoly" rate-setting procedure is being misused to promote investment in DER's by third-party investors.

Assuming unnecessary and unjustified barriers are removed, how much "help" do DERs really need – particularly in the med-term as DER costs continue to fall? Added stimulus for DER investment may not be needed. What tips the policy balance in favor of accelerating DERs are the *environmental benefits* -- a case can be made that more DERs are needed as an alternative to the existing carbon-intensive, central generation model.

The potential of DERs is very real; standing still is not an option for most stakeholders in the electric distribution system. One useful tool for confronting an uncertain future is scenario analysis. For example, the differential impact on stakeholders of business as usual, moderate DER to high DER growth could be identified through a scenario analysis exercise. Scenarios can be adjusted to take account of the dynamic nature of trends in DER technology and deployment.

C. Emerging Technologies

In the first decade of the 21st century, the utility industry increased its deployment of information and communication technology to improve operational efficiency. "Smart Grid" and "smart" metering was hailed as pioneering breakthroughs in distribution applications, though most industry veterans will agree that the application of many smart grid technologies has been largely confined to generation and transmission operations due to the higher cost of these technologies. Insufficient economic justification simply prohibited DER deployment in distribution systems in earlier decades. According to a "The Adoption of New Smart Grid

Technologies" report,[363] "EPRI (2011) conducted a study of customer costs required to enable a fully functioning smart grid above and beyond the costs to meet electric load growth and of the $338 billion to $476 billion total investment in deploying smart grid technology nationwide, costs related to the distribution system account for 69 to 71 percent of the total, while transmission and substation costs account for 19 to 24 percent of the total."[364]

Also beginning in the 21st century and accelerating in recent years, distributed and renewable energy technologies have declined rapidly in cost while increasing in quality. The cost of solar energy has declined by more than 70% since 2009.[365] As of November 2015, four years into the decade-long SunShot Initiative, the solar industry is about 70 percent of the way to achieving SunShot's cost target of $0.06 per kilowatt-hour for utility-scale PV (based on 2010 baseline figures).[366] These technologies — including solar, wind, light-emitting diode (LED) lighting, and recently energy storage — have catalyzed a cleaner and more efficient energy system. Reported system prices of residential and commercial PV systems declined 6–12 percent per year, on average, from 1998–2014, and by 9–21 percent from 2013–2014, depending on system size.[367] Some of the key and emerging trends in technology innovation include:

- Distributed energy resources are becoming more reliable and more affordable.
- Communication technologies are becoming more reliable, faster, and more standardized.
- Investment is flowing into clean energy technology, particularly deployment.
- In a range of industries, including transportation, lodging, ecommerce, and payments, platform technologies are transforming consumer engagement and often lowering costs.
- Data analytics have disrupted major industries like consumer retail.[368]

Disruptive growth in solar energy was met with genuine resistance from utilities, who cited operational challenges in matching intermittent and variable seasonal and daily output to a largely fixed load.[369] Innovations in load management, energy efficiency, and storage

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363 Christopher Guo, Craig A. Bond, and Ana Narayanan, *The Adoption of New Smart-Grid Technologies: Incentives, Outcomes, and Opportunities*, Report commissioned by the Rand Corporation Foundation, 2015, pg. 15. http://www.rand.org/content/dam/rand/pubs/research_reports/RR700/RR717/RAND_RR717.pdf

364 Christopher Guo, Craig A. Bond, and Ana Narayanan, *The Adoption of New Smart-Grid Technologies: Incentives, Outcomes, and Opportunities*, . Report commissioned by the Rand Corporation Foundation, 2015, pg. 41. http://www.rand.org/content/dam/rand/pubs/research_reports/RR700/RR717/RAND_RR717.pdf

365 Mark Bolinger and Joachim Seel, Utility-Scale Solar 2015, "*An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States*," at 34 (August 2016). https://emp.lbl.gov/sites/all/files/lbnl-1006037_report.pdf.

366 Energy.gov Office of the Energy Efficiency & Renewable Energy – Photovolics http://energy.gov/eere/sunshot/photovoltaics

367 *Photovoltaic System Pricing Trends: Historical, Recent, and Near-Term Projections 2015 Ed*., pg. 4, SunShot- U.S. Department of Energy. https://emp.lbl.gov/sites/all/files/pv_system_pricing_trends_presentation.pdf

368 Rhys Grossman, *The Industries that are Being Distributed the Most by Digital*, by Harvard Business Review, March 21, 2016. https://hbr.org/2016/03/the-industries-that-are-being-disrupted-the-most-by-digital

369 *Achieving High Performance with Solar Photovoltaic (PV) Integration*, Accenture, pg 14-15, 2011.. https://www.accenture.com/us-en/~/media/Accenture/Conversion-

technologies are offering solutions to the limitations of variable resources like distributed solar to deliver reliable, high quality power.[370]

Consumers are increasingly adopting DER technologies and in many cases are becoming producers and consumers, known as "prosumers."[371] This transition from consumer to prosumer has the potential to revolutionize retail choice with multiple products and services. In some sense, new forms of retail competition have emerged without any regulatory action. However, if left unaddressed these organic developments in retail competition may result in an unstable system, stranded assets, and higher costs for customers, particularly for those customers who are not responsive or not empowered to take advantage of innovative technologies.[372]

Assets/DotCom/Documents/Global/PDF/Industries_10/Accenture-Achieving-High-Performance-Solar-Photovoltaic-Integration.pdf

370 Sandia Report, *Solar Energy Grid Integration Systems – Energy Storage (SEGIS-ES)*, U.S. Department of Energy, pg. 10-12, July 2008. http://prod.sandia.gov/techlib/access-control.cgi/2008/084247.pdf

371 Residential Prosumers – Drivers and Policy Options, June 2014. http://iea-retd.org/wp-content/uploads/2014/06/RE-PROSUMERS_IEA-RETD_2014.pdf

372 *The Economics of Grid Defection*, Rocky Mountain Institute, February 2014 http://www.rmi.org/electricity_grid_defection

APPENDIX B - CONCURRENT COMMISSION PROCEEDINGS & RULEMAKINGS CONTINUED

A. Commission Proceedings

1. Formal Case No. 874 (GPWG)

This matter involves the Commission's continuous review of WGL's Gas Procurement activities. In 1991, by Order No. 9793, the Commission created the Gas Procurement Working Group ("GPWG"), charged with reviewing and discussing gas procurement planning activities and strategies and filing a Gas Procurement Report ("GPR"). The GPWG was designed to assist the Commission in monitoring WGL's procurement programs by providing information on WGL's gas procurement activities and the cost of services.

Recently, the Commission, in Order No. 18552, issued September 22, 2016, noted that due to changes in the District's retail natural gas market, it was time for the Commission to consider the need for continuing the biennial GPR in its present format and whether and how the GPR could be useful for the Commission and the public in evaluating the natural gas procurement practices of WGL as the default natural gas supplier and in ensuring that the Company's rates charged for natural gas supply service are just and reasonable in today's restructured natural gas market. The Order indicated that to the extent there are other reasonable approaches to procuring natural gas, those approaches should be explored. Pursuant to the Commission's statutory obligation to ensure that every public utility doing business within the District of Columbia is required to furnish service and facilities that are reasonably safe and adequate, the Commission required WGL to provide information on its plans for the management and maintenance of its distribution system similar to the information we require of the Potomac Electric Power Company ("Pepco"), the District's regulated electric distribution company.

Therefore, in Order No. 18552 the Commission directed the GPWG to: (a) reevaluate what procurement practices and evaluation tools are truly necessary in a deregulated market for evaluating WGL's natural gas procurement practices and ensuring that the Company's rates charged for natural gas supply service are just and reasonable; (b) discuss and recommend how the existing GPR could be revised and streamlined to be consistent with the needs of the Commission in evaluating natural gas supply planning and acquisition in a restructured retail market by the default supplier; and (c) discuss and recommend reporting requirements that will enable the Commission to evaluate the effectiveness of WGL's distribution system management and maintenance with respect to increased system efficiency, performance and reliability; and present a status report with recommendations consistent with the objectives set forth in this paragraph within 90 days from the date of the next GPWG meeting which was scheduled to convene on December 6, 2016.

2. Formal Case No. 1017 (SOS)

Under the 1999 Act, all customers who do not choose to purchase their electricity from an electric supplier, or produce electricity themselves as a customer-generator, obtain electricity from the Standard Offer Service (SOS) Program. The SOS Program is the default source of electricity and is administered by the SOS Administrator, currently Pepco, under rules established by the Commission.[373]

Under the SOS Program, the SOS Administrator purchases electricity for SOS customers through power supply contracts in an annual auction. The SOS process provides SOS customers with generation rates that are reflective of market conditions while at the same time providing protection against extreme volatility. Currently, the SOS contracts between Pepco and wholesale providers cover three years of procurement for residential and small commercial customers. The contracts for large commercial customers cover one year of procurement. Three months after the annual bidding, the Commission posts the winning bidders on its website.

On February 1, 2013, the Commission initiated a review of the process for providing SOS in the District.[374] On April 30, 2014, Pepco Holdings, Inc. ("PHI"), the parent company of Pepco, and Exelon Corporation ("Exelon") announced Exelon's proposed purchase of PHI and, on June 18, 2014, submitted an application for a change of control to the Commission. The Commission recognized that its decision on the merger application could potentially impact the operation of the SOS Program because Pepco was then acting as the SOS Administrator and Exelon, through its subsidiaries, has been a frequent winning bidder at SOS auctions. The Commission concluded that the prospect of a subsidiary of Exelon bidding at future auctions where an Exelon-owned Pepco is functioning as the SOS Administrator might raise issues that interested persons would want to address and that the Commission would want to consider as part of its review of the SOS process. Therefore, the Commission suspended our review until such time as we completed our consideration of the merger.

On June 24, 2016, following the issuance of a final order on the Merger, the Commission resumed its review of the SOS Program.[375] The Commission is currently reviewing the comments received in response to the June 24th Order. Once the Commission completes this review of SOS, the Commission will release an Order detailing any changes to the SOS Program. Because the SOS provider could be a purchaser of distributed generation produced from DER facilities, the MEDSIS Initiative is following the outcome of the review of the SOS program and will incorporate it in future analysis.

3. Formal Case No. 1050 (Interconnection)

Interconnection is an important element in the implementation of the grid modernization process as it enables the enhancement of the macrogrid through connection of distributed generation

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373 15 DCMR §§ 4100-4199 (2015).

374 *See Formal Case No. 1017, In the Matter of the Development and Designation of Standard Offer Service in the District of Columbia* ("*Formal Case No. 1017*"), Order No. 17064, rel. February 1, 2013.

375 *Formal Case No. 1017*, Order No. 18257, rel. June 24, 2016.

("DG") and distributed generation resources ("DER"). With regard to the MEDSIS Initiative, clear interconnection procedures will be vital because interconnection is the means by which some of the components under the initiative, such as microgrids and electrical storage, may interact with and contribute to the modernization of the macrogrid. To that point, the Commission's interconnection rules, the District of Columbia Small Generator Interconnection Rules ("DCSGIR") under Chapter 40 of the DCMR, will be instrumental in facilitating grid modernization.

The Commission opened Formal Case No. 1050 on July 31, 2006, to initiate an inquiry into the feasibility of developing uniform interconnection procedures for all customers who have on-site generation and seek to interconnect with Pepco's distribution system.[376] Ultimately, the Commission determined that an interconnection standard is feasible and developed interconnection rules. On February 13, 2009, the Commission promulgated the DCSGIR.[377] The DCSGIR contain the procedures and standards for customers with on-site generation to interconnect with Pepco's electric distribution system.

On March 23, 2016, in Formal Case No. 1119, the Commission issued Order No. 18148, which approved the merger of Pepco and Exelon ("Joint Applicants").[378] In approving the merger, the Commission accepted the Joint Applicants' proposed settlement commitments to improve the interconnection process in the District. Pursuant to Order No. 18160, on July 18, 2016, Pepco filed a Petition to Initiate a Rulemaking Proceeding to Amend 15 DCMR §§ 4004, 4099, and 3602.[379] On July 14, 2016, the Commission issued Order No. 18269, which granted Pepco's request to remove the $100 application fee for Level 1 interconnection applicants.[380] Additionally, on July 25, 2016, the Council enacted the Renewable Portfolio Standard Expansion

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[376] *Formal Case No. 1050, In the Matter of the Investigation of Implementation of Interconnection Standards in the District of Columbia* ("*Formal Case No. 1050*"), Order No. 14017, ("Comment Order") rel. July 31, 2006.

[377] *Formal Case No. 1050, In the Matter of the Investigation of Implementation of Interconnection Standards in the District of Columbia* ("*Formal Case No. 1050*"), *56 D.C. Reg.* 001415-001487 (February 13, 2009); 15 DCMR §§ 4000-4099 (February 13, 2009).

[378] *Formal Case No. 1119*, Order No. 18148, rel. March 23, 2016, Attachment B, Revised Terms and Conditions for Merger ("Merger") of Exelon Corporation ("Exelon") and Pepco Holdings, Inc. ("PHI"), Including Potomac Electric Power Company ("Pepco") (hereinafter referred to as "Attachment B"); See also, Errata Order No. 18160, rel. April 4, 2016. Exelon Corporation ("Exelon") and Pepco Holdings, Inc. ("PHI"), and Potomac Electric Power Company are referred to as the "Joint Applicants."

[379] *Formal Case No. 1119*, Pepco's Petition of Potomac Electric Power Company for the Commission to Initiate a Rulemaking Proceeding to Amend 15 DCMR §§ 4004, 4099, and 3602 ("Petition"), filed July 18, 2016. The proposed amendments include: (1) adding a 20-business-day deadline for issuing the Authorization to Operate to 15 DCMR § 4004.3, (2) adding a definition of "Authorization to Operate" to 15 DCMR § 4099, and (3) establishing deadlines in 15 DCMR §§ 4004.3(a) and (c) and the new 20-business-day Authorization to Operate deadline under 15 DCMR § 4004.3.

[380] *Formal Case No. 1119, Formal Case No. 1050,* Pepco's Request to Eliminate the Level 1 Small Generation Interconnection Fee ("Pepco's Request"), filed June 17, 2016; Order No. 18269, rel. July 17, 2016. Pepco made its request pursuant to Order No. 18148.

Amendment Act of 2016 ("RPS Act of 2016"),[381] which will require an amendment to Chapter 40 of the Commission's rules to address the new capacity level of 15 MW for Small Generators.

On June 21, 2016, Pepco filed PHI's "Interconnection of Distributed Energy Resources" plan, which is addressed in greater detail below, with the Commission.[382] Generally, however, the plan contains purported interconnection enhancements being undertaken by PHI including: streamlining the interconnection application process, reducing the number of incomplete applications, shortening review and approval times, implementing a new automatic application fee tool, providing extensive FAQs, expediting technical review for small systems (< 10kW), and the development of an electronic data interchange ("EDI") for customers to access historical electric usage through the Company's Green Button capability.[383]

Finally, on October 17, 2016, the Commission issued Order No. 18575, which directed Pepco to take certain steps to improve the implementation of interconnection in the District, including, among other directives: (1) direction for Pepco to modify the "Requested Work" label on its website to be more user-friendly; (2) report response time to customer calls beginning with the 2016 Annual Report; (3) direction to provide quarterly reports with information on the number of applications that missed approval deadlines; (4) direction to include a remedial plan for missed deadlines in its quarterly report; (5) provide a quarterly report on the number of incomplete applications for that quarter; and (6) direction for Pepco to provide specific data for currently interconnected solar and non-solar facilities to facilitate our internal monitoring of small generation facilities.[384]

4. Formal Case No. 1086 (Direct Load Control)

On November 3, 2011, in Order No. 16602, the Commission approved Pepco's revised Residential Air Conditioner Direct Load Control ("DLC") Program with updated tariff pages, including a new Rider "R-DLC".[385] The DLC Program allows Pepco to curtail a customer's air conditioner or heat pumps for limited periods of time, during periods of high demand, in exchange for a customer bill credit. The reduction in demand is in turn sold by Pepco as an energy product into the PJM demand response market. The DLC Program was partly funded from Federal stimulus funds and any costs in excess of the Federal grant or PJM market revenues would be recovered through a regulatory asset.[386] On October 16, 2015, in Order No. 18003, the Commission approved Pepco's Phase II of its DLC Program, which extends the program out to

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[381] The Renewable Portfolio Standard Expansion Amendment Act of 2016 ("RPS Act of 2016") was enacted July 25, 2016. *See D.C. Act 21-0466.* The RPS Act of 2016 became effective October 8, 2016. *See D.C. Law 21-0154.*

[382] *Formal Case No. 1119*, Pepco Holdings LLC's Interconnection of Distributed Energy Resources Plan, filed June 21, 2016 ("DER Interconnection Plan").

[383] *See generally*, DER Interconnection Plan.

[384] *Formal Case No. 1050,* Order No. 18575, rel. October 17, 2016. The Commission provided a host of directives for Pepco to improve its interconnection process in ¶¶42-47 of the Order.

[385] *See Formal Case No. 1086,* Order No. 16602, rel. November 3, 2011.

[386] *See Formal Case No. 1086,* Order No. 16602, ¶ 8, rel. November 3, 2011.

December 31, 2017.[387] Since PJM wholesale market changes eliminated opportunities for the DLC Program to obtain revenue after the 2016 PJM Base Residual Auction for the delivery year 2019/2020, the Commission directed Pepco to continue to monitor wholesale market changes and file a reform plan as appropriate.[388] As part of the Phase II DLC Program, Pepco submitted an updated cost/benefit analysis for the DLC Program.[389] Both the recovery of the Formal Case No. 1086 regulatory asset and the DLC's Program cost/benefit analysis are at issue in Pepco's current base rate case, Formal Case No. 1139.

5. Formal Case No. 1098 (Data Access)

On May 17, 2012, Washington Gas Energy Services, a subsidiary of WGL Holding Company, filed a petition for the Commission to open an investigation into retail electricity suppliers' access to their customers' smart meter data to enable advanced pricing options such as dynamic pricing. The Commission, by order, convened a technical conference on July 31, 2012 and provided for the filing of a final report as well as comments.[390] Subsequently, the Commission adjudicated a Pepco dynamic pricing proposal in Formal Case Nos. 1086 and 1109, and investigated the "policy, economic, legal and technical issues" involved in dynamic pricing in Formal Case No. 1114. As a result of these cases the Commission moved numerous related data responses into the record of Formal Case No. 1098.[391] Following an update of the record to incorporate any new developments related to the Pepco's deployment of a new customer information system, Solution One, the Commission will issue an Order in early 2017.

6. Formal Case No. 1114 (Dynamic Pricing)

On March 28, 2014, in Order No. 17432, the Commission opened Formal Case No. 1114, to investigate the policy, economic, legal and technical issues and questions related to establishing a dynamic pricing plan (program) in the District.[392] Formal Case No. 1114 is related to Formal Case No. 1130 because some types of DER ownership models involve customer-owned and operated DER dynamic pricing programs or Price Responsive Demand programs that could be addressed in Formal Case No. 1114.

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387 *See Formal Case No. 1086*, Order No. 18003, ¶ 1, rel. October 16, 2015.

388 *See Formal Case No. 1086*, Order No. 18003, ¶ 13, rel. October 16, 2015.

389 *See Formal Case No. 1086*, Proposal of Potomac Electric Power Company for Phase II of its Direct Load Control Program, Attachment C, filed September 19, 2014.

390 *Formal Case No. 1098, In the Matter of the Investigation into Retail Electricity Supplier Access to Their Customers' Smart Meter Data* ("*Formal Case No. 1098*"), Order No. 16838, ¶¶ 7-8, rel. July 13, 2012.

391 *See Formal Case No. 1086, Formal Case No. 1098, Formal Case No. 1109*, Order No. 17359, ¶ 9, rel. January 24, 2014 and *Formal Case No. 1098, Formal Case No. 1114*, Order No. 17620, ¶ 9, rel. September 9, 2014.

392 *See Formal Case No. 1114, In the Matter of the Investigation into the Issues Regarding the Implementation of Dynamic Pricing in the District of Columbia*, Order No. 18170 rel. April 13, 2016.

7. Formal Case Nos. 1116/1121 (DC PLUG)

The District of Columbia Power Line Undergrounding ("DC PLUG") Initiative was created pursuant to Mayor's Order 2012-130, wherein Mayor Vincent Gray established a task force, which was given specific directives for analyzing "the technical feasibility, infrastructure options and reliability implications of undergrounding new or existing overhead electrical distribution facilities in the District of Columbia." Based on the task force's October 2013 final report recommending expedited legislation for the implementation of the undergrounding initiative, legislation governing the public-private partnership between Pepco and the District of Columbia Department of Transportation ("DDOT") to bury certain overhead power lines to improve electric service reliability in the District of Columbia, the Electric Company Infrastructure Improvement Financing Act of 2013, D.C. Bill 20-387, was introduced in the Council of the District of Columbia and became effective May 3, 2014, D.C. Law 20-102; D.C. Code § 34-1311, *et seq*. (the "Electric Undergrounding Act," or the "Act").

The Act provides for a joint DDOT and Pepco effort to move overhead electrical power lines underground. The project is expected to take 7-10 years to complete and to cost approximately $1 billion. The Act also authorizes the District of Columbia to issue bonds to fund the cost of the work to be performed by DDOT and other related financing costs pursuant to a financing order approved by the Commission. The bonds and costs of the work are to be funded through another surcharge to be collected by Pepco. On April 29, 2014, the Commission opened Formal Case No. 1116 to consider applications for approval of triennial plans.

On June 17, 2014, in accordance with Section 307(a) of the Act, Pepco and DDOT filed with the Commission the first Triennial Plan Application in Formal Case No. 1116, seeking the Commission's approval of their Triennial Underground Infrastructure Improvement Projects Plan. On August 1, 2014, in accordance with Section 302(b) of the Act, Pepco submitted an application for issuance of a financing order.

The Formal Case Nos. 1116 and 1121 dockets contain all matters related to the Commission's review and approval of the Applications ("Undergrounding Initiative"). On November 12, 2014, the Commission approved the Joint Application of Pepco and DDOT for the first Triennial Plan and the surcharge to be collected by Pepco. On November 24, 2014, the Commission in Formal Case No. 1121 approving Pepco's Application for a Financing Order including the imposition of a DDOT surcharge to be collected by Pepco.

Both Commission orders have been challenged and upheld by the D.C. Court of Appeals. However, the Court challenges delayed implementation of the DC PLUG initiative. The DC PLUG initiative has also been delayed by objection by the U.S. General Services Administration ("GSA") that the surcharges amount to a tax on the U.S. Government and are precluded by Federal government immunity. The District and Pepco are working together to propose legislation to the Council to address GSA's concern.[393] As the DC PLUG project aims to increase reliability of the electric grid, including deploying new technologies like distribution automation, it is important that MEDSIS follow the development of the proceeding and its potential impact on the MEDSIS Initiative.

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[393] Council Hearing occurred on November 10, 2016 on Bill 21-0911, "Electric Company Infrastructure Improvement Financing Amendment Act of 2016."

8. Formal Case No. 1119 (Pepco-Exelon Merger)

By Order No. 18148, the Public Service Commission of the District of Columbia ("Commission") granted the Motion of the Exelon Corporation ("Exelon"), Pepco Holdings, Inc. ("PHI"), the Potomac Electric Power Company ("Pepco"), Exelon Energy Delivery Company, LLC ("EEDC"), and New Special Purpose Entity, LLC ("SPE") (collectively, the "Joint Applicants") to file the Joint Applicants' Request for Other Relief that was received on March 7, 2016; adopted the terms and conditions set out in Option 2 in the Joint Applicants' Request, as modified by the Order, as a resolution on the merits of the Merger Application as filed for the Commission's approval, pursuant to D.C. Code §§ 34-504 and 34-1001; and determined that the Joint Application for a change of control of Pepco to be effected by the Proposed Merger of PHI with Purple Acquisition Corp. ("Merger Sub"), a wholly-owned subsidiary of Exelon ("Joint Application"), as filed by the Joint Applicants and as amended by the terms set out in Attachment B to Order No. 18148.[394]

The final terms and merger related commitments are outlined in Order 18160. Several of the conditions explicitly mention, or are implicitly related to, the MEDSIS proceeding. Below, Staff provides is a list of Formal Case No. 1119 merger conditions that relate to Formal Case No. 1130, and in some instances, also relate to other Commission proceedings.[395]

TABLE 9: FORMAL CASE NO. 1119 MERGER CONDITIONS RELATED TO MEDSIS

Formal Case No. 1119 Merger Conditions Related to Formal Case No. 1130
Creation of Formal Case No. 1119 Escrow Fund
Merger Condition # 4. Within sixty (60) days after Merger close, Exelon shall provide Pepco with the funds and Pepco shall establish a Formal Case No. 1119 Escrow Fund with two subaccounts: the Formal Case No. 1130 MEDSIS Pilot Project Fund Subaccount and The Energy Efficiency and Energy Conservation Initiatives Fund Subaccount The escrowed funds shall be placed in an interest-bearing account or invested in instruments issued or guaranteed as to principal and interest and shall be administered by a third party administrator to be paid from a portion of the interest proceeds with the approval of the Commission. Any unused interest will be deposited proportionally into the two subaccounts.
Support for Formal Case No. 1130
Merger Condition # 5. Within sixty (60) days after Merger close, Exelon shall provide funding in the amount of \$21.55 million to the Formal Case No. 1130 MEDSIS Pilot Project Fund Subaccount within the Formal Case No. 1119 Escrow Fund. The fund shall be held in escrow until the Commission approves a pilot project and directs that the funds be released. **Merger Condition # 7(a).** Within sixty (60) days after Merger close, Exelon shall provide funding in the amount of \$11.25 million to the Energy Efficiency and Energy Conservation Initiatives Fund Subaccount within the Formal Case No. 1119 Escrow Fund to support innovative energy

[394] *See Formal Case No. 1119, In the Matter of the Joint Application of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC and New Special Purpose Entity, LLC for Authorization and Approval of Proposed Merger Transaction* ("*Formal Case No. 1119*"), Order No. 18148, rel. March 23, 2016.

[395] Conditions 119, 120 (b)(i), 120 (b)(iv) below are related to Formal Case No. 1050.

conservation or energy efficiency programs targeted primarily towards both affordable multifamily units and master metered multifamily buildings which include low and limited income residents that are sponsored or operated by the District or by qualified non-profit entities that support and enable targeted energy-efficiency programs. The funds shall be held in escrow until the Commission directs that the funds be released.

Merger Condition # 56(c). By June 30, 2021, Pepco shall file with the Commission a comprehensive report on the reliability performance and prudence of actual spending levels for 2016-2020 to allow the Commission to determine whether the escrowed funds should be returned to the Formal Case No. 1130 MEDSIS Pilot Project Fund Subaccount or returned to the Company.

Enhancement to the Interconnection Process and Support for Customer-Owned Behind-the-Meter Distributed Generation

Merger Condition # 119. Pepco shall reflect in its distribution system planning actual and anticipated renewable generation penetration. Beginning not later than six months after closing of the Merger, Pepco's distribution system planning will include an analysis of the long term effects/benefits of the addition of behind-the-meter distributed generation attached to the distribution system within the District of Columbia, including any impacts on reliability and efficiency. Pepco will also work with PJM to evaluate any impacts that the growth in these resources may have on the stability of the distribution system in the District of Columbia.

Merger Condition # 120(b)(i). Provide a report to the Commission within ninety (90) days after Merger closing that provides its criteria limits for distributed energy resources that apply for connection to its distribution. This report shall include supporting studies and information that substantiate those limits. The report will describe and discuss how Pepco considers the generation profile of renewable energy relative to load, as well as discuss the approaches utilized in other jurisdictions that have addressed the issue of the impact of on-site renewable resources on the local grid and circuits. Pepco shall make itself available for discussions with the stakeholders on the report and to demonstrate the modeling tools used by Pepco to perform its analysis to accommodate additional distributed energy resources.

Merger Condition # 120(b)(iii). PHI has provided data to National Renewable Energy Laboratory ("NREL") as part of its in-depth work to review utility interconnection criteria. A report is expected to be issued by the end of 2015. PHI will evaluate its criteria with the criteria outlined in the NREL report to identify any improvements that may be made including treatment of behind-the-meter storage equipment. PHI shall share information, discuss approaches, evaluating interconnection criteria, working with NREL, and providing an opportunity for stakeholders to comment on PHI's proposed recommendations on interconnection criteria prior to public release. PHI will collaborate with stakeholders in good faith but nothing in these Terms and Conditions obligates PHI to accept or be bound by the recommendations of the stakeholders. This collaborative effort will be completed within one (1) year following the approval of the Merger.

Merger Condition # 120(b)(iv). PHI will consider the hourly load shape and the hourly generation of interconnected small generators as a factor to determine the hosting capacity for any given location of a circuit. PHI's hosting capacity determinations shall adopt the minimum daytime load ("MDL") supplemental review screen standards established in FERC Order 792 as well as findings from the collaborative research referenced above that allow for interconnection of distributed generation systems without additional need for study or upgrade investments (e.g., "Fast Track Capacity") as long as aggregate installed nameplate capacity on the circuit, including the proposed system, would not exceed 100% of MDL on the circuit and the proposed system passes a voltage and power quality screen and a safety and reliability screen.

Formal Case No. 1119 Merger Conditions Related to Formal Case No. 1130
Merger Condition # 124. In behind-the-meter applications where the battery never exports while in parallel with the grid and both the battery and the solar system share one inverter, no additional metering or monitoring equipment shall be required for a solar plus storage facility than would be required for a solar facility without storage technology. Pepco, through a stakeholder process, shall undertake appropriate further study of the issues regarding the coupling of solar and storage. As a result of such studies, stakeholders may recommend changes to this protocol to the Commission. Pepco, in consultation with Commission Staff and interested stakeholders, shall determine an appropriate target completion date for this review within one (1) year after Merger closing.
Support of Formal Case No. 1130 - (Investigation into MEDSIS)
Merger Condition # 127. The Commission, pursuant to Order No. 17912 issued on June 12, 2015, opened Formal Case No. 1130. Pepco, as the electric distribution utility in the District of Columbia, is an active participant in this proceeding and is subject to assessment to fund costs of the Commission and the OPC incurred in this proceeding in accordance with the laws of the District of Columbia. Exelon commits that it will support, and cause Pepco to continue to support, the Commission's objectives in opening this proceeding to identify technologies and policies that can modernize the District of Columbia energy delivery system for increased sustainability and to make the District of Columbia energy delivery system more reliable, efficient, cost-effective and interactive. Further, Pepco and Exelon shall support and facilitate the implementation of any pilot projects approved by the Commission that emerge from the Formal Case No. 1130 proceeding.

9. Formal Case No. 1137 (WGL Rate Case)

This matter is a natural gas base rate case in which WGL requests authority to earn an 8.23% overall rate of return, including a return on equity of 10.25%. WGL stated that the requested rates are designed to collect approximately $171.7 million in total annual revenues, which represents an increase in the Company's weather-normalized annual revenues of approximately $17.4 million of which $4.5 million reflects costs associated with system upgrades previously approved by the Commission and paid through customer surcharges. The Company represents that this reflects an overall increase of approximately 7.6% in revenues over and above current rates.

Issue No. 17 may have some relation to the MEDSIS initiative. Issue No. 17 states: Are the proposed rate design and tariff changes, including but not limited to Rate Schedules 3 and 3A (interruptible customers), the proposed Rate Schedules 7 and 7A (combined heat and power/distributed generation facilities), the Multi-Family Piping Program, and the treatment of group-metered apartment customers under proposed Rate Schedules 2B and 2C reasonable in this case?

There may be regulatory and tariff issues regarding cogeneration such as the Commission's authority and the adequacy and appropriateness of current regulations/tariffs and the need for consistency of definitions. The hearings for this matter were held on between mid-October and early November of 2016. The projected issuance of the final Order is March 2, 2017.

10. Formal Case No. 1139 (Pepco Rate Case)

Formal Case No. 1139, Pepco's latest rate case, was initiated on June 30, 2016, when Pepco filed an Application requesting authority to increase existing distribution service rates and charges for electric service in the District of Columbia by $85.5 million.[396] On September 22, 2016, the Commission issued Order No. 18550, which established the procedural schedule for the proceeding and designated the issues in the case. The Order provides the full list of designated issues at Attachment A. Of particular importance to the MEDSIS Initiative is Designated Issue No. 18, which addresses load forecasting as well as other system planning related matters that have been raised in Formal Case No. 1130. Specifically, Issue 18 states:

> Are Pepco's short- term and long-term load forecasts reasonable?
>
> a. Is Pepco's load forecast used in formulating the construction budget and driving the distribution system planning reasonable?
> b. Does Pepco's load forecast reasonably and properly account for the effects of environmentally beneficial and load reducing measures on the load growth projections and capital requirements included in the Construction Program Report, including: (a) solar and other forms of customer-owned, behind-the-meter generation; (b) energy storage facilities; (c) energy efficiency; (d) energy conservation; and (e) similar load reducing measures?
> c. Are the system, substation and feeder level load growth projections used to justify the Reliability projects, Customer Driven projects, and Load projects contained in the Construction Program Report reasonable?
> d. What steps should be taken to improve Pepco's short-term and long-term load forecast process and reporting for the future?[397]

The procedural schedule also provided in Order No. 18550 sets the evidentiary hearings for March 2017 and anticipates that the final order in the proceeding will be issued in July 2017, absent changes in the procedural schedule.[398]

B. Commission Rulemakings

1. Energy Supplier Rules: Formal Case No. 945 (Investigation into Market Competition) & RM46-2015-01 (Investigation into Licensure Rules)

In this rulemaking, the Commission, pursuant to its authority under Sections 34-1501 through 1520 and 34-1671.01 through 1671.14 of the D.C. Code, has previously given notice of the creation of Chapter 46 of Title 15 of the DCMR. Chapter 46 is a new chapter which establishes

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396 *Formal Case No. 1139*, *In the Matter of the Application of Potomac Electric Power Company for Authority to Increase Existing Retail Rates and Charges for Electric Distribution Services* ("*Formal Case No.* 1139"), at 3, filed June 30, 2016 ("Pepco's Application"). Subsequently, this request was revised to $82.1 million in supplemental testimony.

397 *Formal Case No. 1139,* Order No. 18550, Appendix A, rel. September 22, 2016.

398 *Formal Case No. 1139*, Order No. 18550, Attachment B.

rules governing the licensure and bonding of Electricity Suppliers in the District of Columbia, pursuant to the Retail Electric Competition and Consumer Protection Act of 1999 ("1999 Act") as codified in Sections 34-1501 through 1520 of the D.C. Code. Currently, the requirements for licensing Electricity Suppliers are set forth in Formal Case No. 945, Order No. 11796, rel. September 18, 2000. Bonding requirements for Electric Suppliers are set forth in Formal Case No. 945, Order No. 11862, rel. December 18, 2000.

This Rulemaking proposes to put the licensing and bonding requirements in a single chapter. The Notice of Proposed Rulemaking ("NOPR") includes the following attachments: (1) Supplier Application; (2) Form of Integrity Bond for Electric Suppliers other than Aggregators and Brokers-Surety Bond; (3) Form of Integrity Bond for Aggregators and Brokers-Surety Bond; (4) Form of Customer Payments Bond-Surety Bond; and (5) Notice of Application. A first NOPR was published on February 6, 2015 (62 *D.C. Reg.* 001712-001733) and comments were received in response to the NOPR. A second NOPR will be published with revised sections from the first NOPR based upon comments received. This rulemaking relates to Formal Case No. 1130 because it provides the rules for licensing and regulating potential DER market third-party providers who intend on supplying and reselling electricity in the District of Columbia.

2. Generating Facility Approval

Pursuant to D.C. Code § 34-1516, "no person shall construct an electric generating facility for the purpose of the retail or wholesale sale of electricity unless the Commission first determines, after notice and a hearing, that the construction of the electric generating facility is in the public interest."

In response to D.C. Code § 34-1516, the Commission developed regulations for reviewing and approving the construction of a generating facility. The Commission's rules are found in 15 DCMR Chapter 21, (Provision for Construction of Electric Generating Facilities and Transmission Lines). Specifically, 15 DCMR § 2100.2 states: "No person shall construct an electric generating facility in the District of Columbia for the purpose of selling electricity unless the Commission first determines, after notice and a hearing, that the construction of the facility is in the public interest." As part of the above provisions under 15 DCMR § 2112.1, "the Commission may, in its discretion, *waive or modify* any provision of this Chapter…." Also, pursuant to 15 DCMR § 2112.2, "the applicant may, at the time of application, request that the Commission waive any provision in this Chapter for good cause shown." The current rules make no distinction between renewable and fossil fuel generators.

This provision relates to MEDSIS because under the current rules before any type of electric generating facility (*i.e.*, microgrid) can be built for the purpose of selling electricity in the District, it must be reviewed by the Commission pursuant to the notice and hearing requirements established in 15 DCMR Chapter 21. However, to the best of Staff's knowledge, the Commission has yet to receive an application from any person or entity requesting Commission approval to construct an electric generating facility pursuant to the Chapter 21 rules.

3. Net Energy Metering & Community Net Metering

Net Energy Metering ("NEM") and Community Net Metering ("CNM"), discussed below, may also become prominent in the MEDSIS Initiative discussion. One of the benefits of grid modernization is that it allows the customer to participate and interact with the macrogrid through ownership or stake in distributed generation ("DG") facilities. As NEM and CNM evolve, the facilities may become valuable contributors to reliability of the macrogrid through the electricity they push on to the local distribution system. While these two practices are currently available in the District, the MEDSIS Initiative may be the forum to discuss how NEM and CNM may be expanded, through statute and regulation, to provide more benefits to the local distribution system.

In Formal Case No. 945, the Commission adopted Rulemaking No. 9 ("RM-9"), which addresses net energy metering and community net metering. Net Energy Metering ("NEM") is defined as **"**the difference between the kilowatt-hours consumed by a customer-generator and the kilowatt-hours generated by the customer-generator's facility over any time period determined as if measured by a single meter capable of registering the flow of electricity in two directions."[399] On February 10, 2005, the Commission issued Order No. 13501 adopting final rules and regulations implementing the NEM provisions of the District of Columbia Retail Electric Competition and Consumer Protection Act of 1999, as amended.[400] Since their adoption, the NEM Rules, Chapter 9 of the DCMR, have undergone modification. One modification was to ensure that NEM customers are compensated for their excess energy at the "Full Retail Rate," which consists of generation, transmission, and distribution credits.[401] The other key amendment to the NEM Rules was to ensure the rules comported with the "Clean and Affordable Energy Act of 2008,"[402] which increased the capacity of facilities eligible to participate in NEM, 100 kW to 1,000 kW.[403] NEM Rules have not been amended since that time. However, Chapter 9 itself has been amended and expanded to address another element of distributed generation, CNM.

CNM is defined as a billing arrangement under which the monetary value of electric energy generated by a Community Renewable Energy Facility ("CREF") and delivered to the Electric Company's local distribution facilities is used to create a billing credit for CREF Subscribers.[404] On October 17, 2013, the Council enacted the "Community Renewable Energy Amendment Act of 2013" ("CREA").[405] The CREA required the Commission to establish rules to facilitate the

399 15 DCMR § 999, Definitions.

400 *Formal Case No. 945*, Order No. 13501, rel. February 10, 2005; Retail Electric Competition and Consumer Protection Act of 1999, D.C. Code §§ 34-1501-1520 (2001 Ed.). The Notice of Final Rulemaking was published in the *D.C. Register* on February 18, 2005.

401 *Formal Case No. 945*, Order No. 14840, rel. June 25, 2008.

402 D.C. Code § 34-1501 (15) (2001 Ed.); The Clean and Affordable Energy Act ("CAEA") amended the definition for Customer-Generator. The CAEA became law on October 22, 2008. *See D.C. Law 17-250.*

403 D.C. Code § 34-1501 (15) (2001 Ed.).

404 15 DCMR § 999, Definitions.

405 The Community Renewable Energy Amendment Act of 2013 ("CREA") was enacted October 17, 2013. *See D.C. Act 20-0186.* The CREA became effective December 13, 2013. *See D.C. Law 20-0047.*

implementation of CNM in the District.[406] In Order No. 18762, the Commission adopted the CNM provisions, which resulted in the amendment of Chapter 9 of the DCMR.[407] Subsequently, the Community Renewable Energy Credit Rate Amendment Act of 2016 was enacted on August 18, 2016 and became effective October 8, 2016. This Act requires additional amendments that will impact the definition of the CREF Credit Rate and the Compensation for CRED Subscribers.[408] The Commission issued a NOPR regarding the CREF Credit Rate on October 28, 2016 and a Notice of Final Rulemaking on December 30, 2016.[409] Additionally, the Commission issued a Notice of Proposed Tariff on December 30, 2016 concerning Pepco's Proposed Community Net Metering Rider, which incorporates the revised CREF Credit Rate.[410]

While the Commission has promulgated the relevant rules for implementing the statutory requirements of Community Renewable Energy Credit Rate Amendment Act of 2016, the legislation has created two interrelated problems. First, the legislation requires the SOS Administrator to purchase CREF output at the price of the SOS Rate for Small Commercial Customers plus all other costs associated with being small Commercial Customer, *i.e.*, all non-energy related costs of being a Pepco Small Commercial customer. Unfortunately the SOS Administrator can only sell the CREF output at the SOS energy Rate for Small Commercial Customers, as all non-energy related costs collected by the SOS Administrator are passed on to the appropriate third-party for each associated cost. This results in a shortfall to the SOS Administrator of the total non-energy related costs for each kWh sold associated with being a Pepco Small Commercial customer.[411] To remain whole, the SOS Administrator has to pass these unrecoverable costs on to Pepco. Pepco has to have a way of recovering these cost or else these costs represent an illegal taking. CREA contains a method for Pepco to recover these costs in Section 122 of the CREA:

> …the electric company may seek recovery of any costs associated with the implementation of this act in a base rate case. In a base rate case filing that includes recovery of such costs, the electric company shall include in its filing with the Commission any

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406 *See* Sec. 2 of the CREA amending 118(b) of the Retail Electric Competition and Consumer Protection Act of 1999, which amends D.C. Official Code § 34-1518 by adding paragraph 5.

407 *Formal Case No. 945, In the Matter of the Investigation into Electric Service Market Competition and Regulatory Practices* ("*Formal Case No. 945*"); *RM9-2015-01, In Matter of 15 DCMR Chapter 9-Net Energy Metering-Community Renewable Energy Amendment Act of 2013* ("*RM9-2015-01*"), Order No. 17862, rel. April 24, 2015.

408 The Community Renewable Energy Credit Rate Clarification Amendment Act of 2016 ("CRECRCAA") was enacted August 18, 2016. *See D.C. Act A21-0488*. The CRECRCAA became effective October 8, 2016. *See D.C. Law L21-0160*.

409 *RM-09-2015-01*, Notice of Proposed Rulemaking re Chapter 9, 63 D.C. Reg. 013501-013502 (2016); *RM-09-2015-01*, Notice of Final Rulemaking re Chapter 9, 63 D.C. Reg. 016089-016090 (2016).

410 *RM-09-2015-01*, Notice of Proposed Tariff, 63 D.C. Reg. 016183-016185 (2016).

411 SOS rates are required to be determined through a competitive bidding process. If the payment of non-energy costs, associated with being a small Commercial Customer, to the CREF are passed on to SOS customers that would create an SOS rate that is, partially, determined through a non-competitive process in violation of Commission rules and sound rate making principles.

> benefits and costs to the electric company. Any recovery of the net costs by the electric company approved by the Commission shall occur solely through a rate assessment of the subscribers.

This effectively means that in Period 1 residential CREF subscribers receive a payment in excess the value of their CREF energy, *i.e.*, the total non-energy related costs associated with being Pepco Small Commercial customer, and in Period 2, Pepco recovers these same costs "solely through a rate assessment of the subscribers." The situation created by the interplay of these two pieces of legislation does not appear to be a viable long term arrangement.

C. Related Reports, Proceedings, & Industry Organizations

1. PHI Interconnection of Distributed Energy Resources Plan

On June 21, 2016, Pepco filed an "Interconnection of Distributed Energy Resources" report in order to address DER-related commitments resulting from the Commission's approval of the PHI's merger with Exelon.[412] In this report, among other things, PHI discusses its interconnection application review and approval process as well as improvements being adopted to help facilitate the interconnection of proposed renewable-energy projects to Pepco's distribution system. In the report, PHI recognized the growing number of interconnection applications being filed with Pepco and "the increasing need to streamline the interconnection application review process to minimize delays, decrease operating issues, and improve the overall customer interconnection experience."[413] PHI noted its efforts to streamline the process include "a new online application website," "a new application fee process, increased internal cross-jurisdiction facilitation and coordination, and reduction in processing time down to one business day for customer class, voicemail returns, and Green Power Connection Mailbox messages."[414]

PHI also notes increased customer education and outreach measures to educate customers on the interconnection process as well as the implementation of expedited technical review of interconnection applications ("Fast Track Process") that meet certain criteria.[415] PHI notes the development of an electrical data interchange ("EDI") tool that went live in April 2016 to allow "customers and customer representatives to access historical electric usage through the Company's Green Button capability."[416] Several of these identified improvements relate to proposed requirements by stakeholders in this proceeding. The Commission should consider whether these changes in the interconnection process go far enough to facilitate DER deployment or whether additional regulations are needed.

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412 *See Formal Case No. 1119*, Interconnection of Distributed Energy Resources Report, filed June 21, 2016 ("Interconnection Report").

413 Interconnection Report at 13.

414 Interconnection Report at 14.

415 Interconnection Report at 16-17.

416 Interconnection Report at 17. *See* www.pepco.com/gpc.

The Interconnection Report also identifies challenges to incorporating behind-the-meter solar and energy storage, such as potential system impacts on the grid, inappropriate net-metering standards, concerns regarding accounting for Renewable Energy Certificates ("RECs"), lack of communication between the customer and utility systems that may lead to negative impact on the macrogrid, as well as procedural and administrative challenges.[417]

2. PHI Distributed Energy Resources & the Distribution System Planning Process

On September 23, 2016, Pepco filed a report on "Distributed Energy Resources and the Distribution System Planning Process" in accordance with Paragraph 119 of Attachment B of the Order No. 18148 ("DER Planning Report").[418] The report notes that requests for interconnection of distributed generation ("DG") have increased greatly in recent years, across all PHI territories. The report says that "[t]his is largely due to consumer preferences, decreasing technology costs, and public policy objectives and incentives intended to incorporate greater amounts of renewable energy."[419]

The DER Planning Report provides an overview of PHI's peak load planning process and the various factors that guide PHI's consideration of distributed energy resources in the peak load planning process. The report explains how the peak load planning process considers demand response, energy efficiency, and distributed generation. PHI's efforts to engage DER stakeholders are described in the report. According to the report, "PHI is still in the early stages of evaluating how energy storage can be used to the benefit of the distribution system."[420]

3. MD PSC Case No. 9361 (Pepco-Exelon Merger) – Pepco filing on Merger Condition 14 and Initial Considerations for Grid Modernization in Maryland

On June 30, 2016, Pepco and Delmarva Power filed a request with the Maryland Public Service Commission ("MD PSC") for that Commission to initiate a MEDSIS-style "proceeding to examine opportunities to transform the electric distribution grid in the State of Maryland." More specifically, Pepco asserts that in accordance with Merger Condition 14 in Maryland, "Exelon will fund up to $500,000 for the Commission to retain a consultant to study relevant issues and facilitate [the] proceeding," which Pepco asserts "should address at a minimum the following topics: the incorporation of smart-grid technology, microgrids, renewable resources, and distributed generation" in a workgroup process with interested stakeholders.[421] Attached to Pepco's request to initiate a grid modernization proceeding in Maryland, the Company also

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417 Interconnection Report at 35-38.

418 *See Formal Case No. 1119*, Distributed Energy Resources and the Distribution System Planning Process Report, filed September 23, 2016 ("DER Planning Report").

419 DER Planning Report at 4.

420 DER Planning Report at 37.

421 MD PSC Case No. 9361, *Initial Considerations for Grid Modernization in Maryland*, at 1, filed June 30, 2016. ("Pepco MD MEDSIS Proposal").

included "a paper that provides the Commission and other stakeholders a high-level overview of the relevant issues and offers PHI's perspective on key components to be considered in the grid modernization proceeding." PHI contends that "[a]ll grid modernization efforts should be fully integrated with the distribution system to the maximum extent possible."[422]

On September 26, 2016, the MD PSC opened "Public Conference 44 (PC44)," its proceeding on transforming the electric distribution system in Maryland, to consider the following key topics:

- Enhancing Rate Design options, particularly for electric vehicles
- Calculating benefits and costs of distributed energy resources ("DER"), including solar energy
- Maximizing Advanced Meter Infrastructure (Smart Meters) benefits
- Valuing Energy Storage properly
- Streamlining the Interconnection Process for distributed energy resources
- Evaluating Distribution System Planning
- Protecting Limited-Income Marylanders[423]

Comments were due on these issues by October 28, 2016. Commission Staff will monitor this proceeding.

4. Maryland Resiliency Through Microgrids Task Force Report

On February 25, 2014, Governor Martin O'Malley directed his Energy Advisor to lead a Resiliency Through Microgrids ("Task Force") to study the statutory, regulatory, financial, and technical barriers to the deployment of microgrids in Maryland.[424] The Governor required the Task Force to develop a "roadmap for action" to pave the way for private sector deployment of microgrids across the State of Maryland.[425] On June 23, 2014, the Maryland Resiliency Through Microgrids Task Force Report ("Task Force Report") was published.

In the Task Force Report, the Task Force defined a microgrid as a "collection of interconnected loads, generation assets, and advanced control equipment installed across a defined geographic area that is capable of disconnecting from the macrogrid (the utility scale electric distribution system) and operating independently."[426] The Task Force indicated that "microgrids are currently being deployed across the State in numerous settings; one popular application is the "campus-style" microgrid."[427] The Task Force reported that campus-style microgrids "serve a

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422 Pepco MD MEDSIS Proposal at 1-2.

423 Public Conference 44, In the Matter of Transforming Maryland's Electric Distribution Systems to Ensure that Electric Service is Customer-Centered, Affordable, Reliable, and Environmentally Sustainable in Maryland, Notice of Public Conference, rel. September 9, 2016.

424 Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i (June 23, 2014).

425 Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i (June 23, 2014).

426 Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i (June 23, 2014).

427 Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i (June 23, 2014).

singular customer on a single parcel of property."[428] However, the Task Force Report primarily focused on public purpose microgrids. The Task Force defined public purpose microgrids as those serving "critical community assets across multiple properties." The Task Force indicated that critical community assets "include resources that provide important community functions, such as community centers, commercial hubs, and emergency service complexes."[429] The Task Force discussed that "facilities that contribute to quality of life during an extended power outage could also be included in a public purpose microgrid."[430] Additionally, the Task Force indicated that "a public purpose microgrid may be owned in whole or in part by either an electric distribution company or a third party entity, and that it must provide services to multiple customers across multiple property lines."[431]

The Task Force recommended for the short term that the State of Maryland "focus on the development of utility-owned public purpose microgrids through advocacy and incentives."[432] Also, the Task Force recommended that "the Maryland Energy Administration conduct a holistic analysis of tariffs that help define the value of distributed generation ("DG") to the macrogrid as well as engage in a comprehensive review of siting, interconnection, and commissioning procedures."[433]

For the long term, the Task Force recommended that "the state focus on reducing barriers to entry to third parties (non-utilities) wishing to offer public purpose microgrid services to multiple customers in Maryland, whether those services are offered in new developments or over existing electric distribution company assets."[434]

The Task Force believes that these recommendations if implemented will speed the adoption of public purpose microgrids in Maryland.

5. OPC's Value of Solar Report (First Quarter 2017)

Pursuant to a legislative charge from the Council of the District of Columbia to address emerging alternatives for energy choice for residential consumers, the Office of the People's Counsel ("OPC") is in the process of producing a Value of Solar study for the District of Columbia. Consistent with the intent of the Council's directive, the Study will comprehensively assess the District's solar capacity and provide a framework for valuation of solar energy generation.

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[428] Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i (June 23, 2014).

[429] Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i (June 23, 2014).

[430] Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i (June 23, 2014).

[431] Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i (June 23, 2014).

[432] Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i (June 23, 2014).

[433] Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page i-ii (June 23, 2014).

[434] Maryland Resiliency Through Microgrids Task Force Report, Executive Summary, Page ii (June 23, 2014).

OPC's Value of Solar Study will assess the District's physical solar capacity; evaluate the District of Columbia's current net metering policies; analyze the costs and benefits – including quantification of social, health, and environmental benefits – of distributed solar energy generation in the District of Columbia and the regional transmission grid; and provide a framework for determining a rate design approach that can facilitate solar deployment with minimal negative impact on ratepayers not participating in solar energy generation. The Study will also include a comprehensive empirical assessment of opportunities for increased participation in solar energy generation by limited- and low-income residents in the District.

OPC has retained consultants Synapse Energy Economics and Jerome Paige & Associates to conduct the Study. Synapse Energy Economics is performing the research and analysis on the value of solar for the District as a whole. Jerome Paige & Associates is conducting the research and analysis on DC low-income solar access issues. OPC anticipates that the entire project will be completed in the first Quarter of 2017.[435]

4. DOEE's Solar for All (February 2017)

"Solar for All" is a legislatively-mandated program for DOEE. It requires DOEE to use the Renewable Energy Development Fund ("REDF"), which is funded by alternative compliance payments under the Renewable Portfolio Standard program, to build enough solar capacity in the District to reduce the monthly electricity bill of at least 100,000 low-income households by 2032. The program also focuses on providing access to solar generation for non-profits, senior citizens, and small businesses. Notably, the program would allow the use of REDF for solar-ready improvements such as roof repair and electrical line upgrades. DOEE is scheduled to submit an Implementation Plan to the D.C. Council in February 2017.

5. DOEE's Microgrid Study (Urban Ingenuity)

In 2015 and 2016, Urban Ingenuity has led a research project on the feasibility of District energy microgrids in Washington DC under a grant from the District Department of Energy and Environment's (DOEE) Green Building Fund. The purpose of this work is to explore how District energy microgrids can form a platform for building a more modern, technologically enabled, environmentally sustainable, and climate resilient energy infrastructure for the Nation's capital. Specifically, this research is outlining a roadmap for supporting concrete microgrid projects in the District of Columbia by improving clarity on the technical, financial, and policy foundations for microgrid project development, and laying a platform for new government policy and agency program support for leading-edge District energy projects. This data-driven research is providing direct-decision support for property owners and developers to advance microgrids at specific sites in Washington DC. Work has included exploring market potential and technical feasibility for diverse sites, including proposed campus scale energy projects at the Saint Elizabeth's East Campus, Gallaudet University/Union Market, US General Services Administration Heating Operation and Transmission Division ("HOTD") plant, Walter Reed Army Medical Center, and other proposed economic development projects with potential to anchor innovative microgrid systems. Urban Ingenuity has also developed a customized site-screening tool to assess microgrid potential using available data, and is outlining policy

[435] Status Updated provided by OPC on October 6, 2016 and January 9, 2017.

frameworks and financial resources to support district energy project development at new sites in Washington DC.

Moving forward in FY 2017, the team will continue to provide strategies to DOEE, other public agencies, and private developers, for improving policy and market certainty, and for expanding the engagement of capital markets and DC economic development resources in support of microgrid projects. These efforts will be supported by a go-to-market program of stakeholder outreach and microgrid "extension services;" bringing tools, analysis, and expert technical assistance to project-level decision-making to improve economic and environmental outcomes. This research acknowledges that building microgrids and "microgrid-ready" buildings and campuses is complicated, and that property owners need more support to move forward with projects. Improving the process of assessing, financing, and building microgrids will help guide community stakeholders and industry partners through the practical steps of microgrid development, and engage new private investment in building state-of-the-art clean energy infrastructure for District residents, ratepayers, and businesses. This research is conducted under fiscal sponsorship of the Community Foundation of the National Capital Region, with critical support from the engineering firm CHA, the Van Ness Feldman law firm, Microgrid Institute, UN Foundation Energy Future Coalition, Georgetown University Climate Center, Georgetown University Urban and Regional Planning Program, and other leading experts in the field. Urban Ingenuity also serves as program administrator to the Washington DC Property Assessed Clean Energy ("PACE") financing program, which is available to fund clean energy microgrid projects for commercial, institutional, and multi-family building owners in the District of Columbia.

6. D.C. Sustainability Plan

The District Government has issued a sustainability plan for the District that envisions short and long-term actions to move the District toward a more sustainable city over the course of 20 years.[436] In the DC Sustainability Plan the District lays out "2030 Goals and Targets," focusing both on the challenges and solutions to meeting those goals. Among those goals are "climate and environment," "built environment," and "energy." Staff believes that while the Commission's mission intersects most directly with "energy," all of these areas have aspects that overlap with the Commission's mission and, therefore, the Commission needs to consider the District's plans related to these topics and how those plans converge and diverge from potential Commission goals stemming from MEDSIS.[437]

- For "Climate and Environment," the District government wants to: (1) minimize the generation of greenhouse gas emissions from all sources by 50% by 2030; and (2)

[436] Sustainable DC Plan - http://sustainable.dc.gov/sites/default/files/dc/sites/sustainable/page_content/attachments/DCS-008%20Report%20508.3j.pdf. *See also*, Sustainable DC Plan Summary - http://www.sustainabledc.org/wp-content/uploads/2012/10/SDC-Summary-Document-2-19_0.pdf

[437] "Policy prescriptions should align utility incentives to public interest outcomes as identified in DC statutes and the DC Sustainability Plan, including alignment with decarbonization of power generation (CO2 reduction goals), safety, and protection of environmental quality." Formal Case No. 1130; Comments of the Grid 2.0 Working Group, DC Climate Action, DC Environmental Network, and Chesapeake Climate Action Network, at 2, filed July 25, 2016.

advance physical adaptation and human preparedness to increase the District's resilience to future climate change by requiring new building and infrastructure projects to undergo climate change impact assessment as part of the regulatory planning process.[438]

- For "Built Environment," the District government wants to: (1) increase urban density; (2) develop attractive neighborhoods to create new economic opportunity and support a high quality of life; (3) improve the sustainability performance of existing buildings by retrofitting 100% of existing commercial and multi-family buildings to achieve net-zero energy standards; and (4) ensure the highest standard of green building for new construction by requiring all new construction to meet net-zero energy use standards.[439]
- For "Energy," the District government wants to: (1) improve the efficiency of energy use to reduce overall consumption by 50% by 2030; (2) increase the proportion of energy sourced from clean and renewable supplies to make up 50% of the Districts energy supply; (3) modernize energy infrastructure for improved efficiency and reliability by reducing annual power outages between 0 and 2 events of less than 100 minutes per year.[440]

In order to achieve these goals, the District government has made it clear that District government agencies, businesses, community organizations, among others, will have to collaborate in this effort. Furthermore, the District recognizes the immediate, short-term need to identify existing laws, regulations, and policies that conflict with sustainability goals and areas where new authority is required. Specifically, in Action 1.3 of the Sustainability Plan the District stated:

> Some new and innovative practices will conflict with existing laws or regulations while others may not even be possible in the District without new legal authority. Working with agencies, businesses, community stakeholders, and the DC Council, Sustainable DC staff will identify problem areas and develop solutions that pave the way for implementation of sustainable practices[441]

In April 2016, the Third Year Progress Report on the Sustainable DC Plan was released.[442] In energy field, the Report asserts that "[t]he District is doubling down on its commitment to increase the energy efficiency of District buildings – especially for low-income residents – and to increase the proportion of clean, renewable sources like wind and solar. At the same time, we're planning to increase the resilience of our systems in preparation for a changing climate."[443] The Report also provides the District's progress towards meeting the initial goals of the Sustainable DC Plan; noteworthy progress in the energy field includes:

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438 Sustainable DC Plan at 10.

439 Sustainable DC Plan at 11.

440 Sustainable DC Plan at 11.

441 Sustainable DC Plan at 17.

442 Sustainable DC Plan, Third Year Progress Report, April 2016 ("Sustainable DC Progress Report"). http://www.sustainabledc.org/wp-content/uploads/2014/04/SustainableDC2016ProgressReport.pdf

443 Sustainable DC Progress Report at 5.

- In 2015, the District added 800 small generator systems to the grid. A 54% increase over 2014 installations, these systems will generate an additional 9.37 megawatts of renewable energy.
- The Department of General Services will boost District Government's total solar power generation by 70% by installing solar on the roofs of 34 District-owned buildings. Projected to create 140 jobs, installation on the first five sites is underway.
- Between the 11.4 megawatts of solar power systems the Department of General Services is installing and the 46 megawatts of power purchased from a regional wind farm – the largest wind power purchase agreement of its kind by a U.S. city – 35-40% of the electricity used by the District Government will come from renewable energy.
- D.C. Water's innovative 10 megawatt anaerobic digester at Blue Plains Advanced Waste Water Treatment Plant produces enough energy to power 100 million vehicles miles traveled.
- The Department of Energy & Environment and the DC Sustainable Energy Utility invested approximately $23 million in energy efficiency and renewable energy services, yielding more than $92 million in lifetime energy savings for residents and businesses.[444]

The Commission should consider: (1) how does the Commission fit into this plan, and (2) how can the initiatives stemming from MEDSIS further both the Commission's mission and the short and long-term sustainability goals of the District.

7. Clean Energy DC

Clean Energy DC contains "DOEE's proposal to reduce greenhouse gas (GHG) emissions by 50% below 2006 levels by 2032."[445] *Clean Energy DC* provides recommendations across three major sections of the District's energy system: (1) Buildings, (2) Energy Supply, and (3) Transportation. *Clean Energy DC* asserts that "[e]ach section provides a pathway to achieving the District's targets and presents a full suite of climate and energy policies necessary to achieve them."[446] The CEP notes that it is "a 'living document' to continually guide the District based on new information."[447] Of particular relevance to the MEDSIS Initiative, *Clean Energy DC* asserts that the District Government has commissioned several studies to support its policies and program developments, including a study on the role of microgrids, which is forthcoming.[448]

Clean Energy DC also addresses the District's Electricity System Modernization and references the MEDSIS Initiative. Specifically, *Clean Energy DC* asserts that "a much higher proportion of the District's total electricity supply must be shifted to renewable energy to meet the District's

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444 Sustainable DC Progress Report at 5.

445 *Clean Energy DC The District of Columbia Climate and Energy Plan* at 3, October 2016 ("*Clean Energy DC*").

446 *Clean Energy DC* at 6.

447 *Clean Energy DC* at 10.

448 *Clean Energy DC* at 30.

targets, both from outside and within the District of Columbia" and that "[a]t the same time the District pursues these climate and energy targets, increasing pressures are being placed on the electricity grid" – like aging infrastructure.[449] *Clean Energy DC* notes that the District's Sustainability Plan "has set a goal to reduce the total number of annual power outages to between zero and two events of less than 100 minutes per year."[450] *Clean Energy DC* asserts that the District's current electrical grid is "inefficient" with "overall grid utilization at approximately 53%" which presents "a significant opportunity to improve the cost-effectiveness of the District's electricity system through a shift in grid infrastructure and operations."[451]

Clean Energy DC acknowledges that "the specific process through which jurisdictions will modernize their grid is not yet fully understood, one particular framework for grid modernization," however, is "a three-stage evolutionary process driven by higher DER adoption;" (1) Grid Modernization, (2) DER Integration, and (3) Distributed Markets.[452] The *Clean Energy DC* proposes the following policy objective be adopted by the District as it pertains to grid modernization:

> The District of Columbia will make a phased and strategic transition to a 21st Century energy supply system that supports the District in achieving its priorities as set forth in the Sustainable DC Plan. The modernized energy delivery system will be designed, operated, and regulated to empower District residents and businesses, while supporting innovation in energy services through advanced distributed energy resources and dynamic energy management capabilities. The system will be highly efficient, resilient, reliable, secure, flexible, and deliver affordable power to customers.[453]

8. Argonne National Lab & Exelon Research Partnership

The U.S. Department of Energy's Argonne National Laboratory ("Argonne") and Exelon have formed a five-year cooperative research and development agreement focused on identifying new technology and systems that will advance clean energy and contribute to the development of a next-generation energy grid.[454] The agreement combines Exelon's market knowledge with Argonne's broad research and expertise in all phases of energy production and delivery.[455] The

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[449] *Clean Energy DC* at 133.

[450] *Clean Energy DC* at 134.

[451] *Clean Energy DC* at 133.

[452] *Clean Energy DC* at 136.

[453] *Clean Energy DC* at 136.

[454] *Argonne National Lab and Exelon Launch Research and Development Partnership to Advance Next Generation Energy Technology*, Business Wire, October 19, 2016.

[455] *Argonne National Lab and Exelon Launch Research and Development Partnership to Advance Next Generation Energy Technology*, Business Wire, October 19, 2016.

collaboration will further the goal of Argonne and the U.S. Department of Energy to identify technologies that have the potential to improve grid reliability, efficiency and stability, and introduce those technologies to the market where they can have the greatest benefit to consumers and the public.[456]

9. Mid-Atlantic Distributed Resources Initiative (MADRI)

The Commission and its Staff are active members in the MADRI working group. MADRI was established in 2004 by the public utility commissions of Delaware, District of Columbia, Maryland, New Jersey, and Pennsylvania, along with the U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), Federal Energy Regulatory Commission (FERC), and PJM Interconnection.[457]

MADRI seeks to identify and remedy retail barriers to the deployment of distributed generation ("DG"), demand response, and energy efficiency in the Mid-Atlantic region. The guiding principle for MADRI is a belief that distributed resources should compete with generation and transmission to ensure grid reliability and a fully functioning wholesale electric market.[458]

MADRI has three main goals: (1) Educate stakeholders, especially state officials, on distributed resource opportunities, barriers, and solutions; (2) Develop alternative distributed resource solutions for states and others to implement; and (3) Pursue regional consensus on preferred solutions.[459]

In 2006, MADRI issued a MADRI Policy Statement in support of Mid-Atlantic DER Initiatives. MADRI encouraged "state utility policy makers and regulators to consider changes to encourage cost effective DER programs including: (1) removing market barriers; (2) developing appropriate regulatory treatments; (3) reducing utility disincentives to accommodating DER; (4) establishing DER program goals; (5) proving DER programs incentives; and (6) testing solutions at a pilot scale as step toward full implementation." MADRI suggested that state utility policymakers and regulators may consider special studies and pilot programs to evaluate the costs and benefits of DER technologies such as metering and communications infrastructure that enable dynamic retail pricing regimes.[460]

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456 *Argonne National Lab and Exelon Launch Research and Development Partnership to Advance Next Generation Energy Technology*, Business Wire, October 19, 2016.

457 *About MADRI*, Mid-Atlantic Distributed Resources Initiative Working Group, accessed November 1, 2016. http://sites.energetics.com/madri

458 *About MADRI*, Mid-Atlantic Distributed Resources Initiative Working Group, accessed November 1, 2016. http://sites.energetics.com/madri

459 *About MADRI*, Mid-Atlantic Distributed Resources Initiative Working Group, accessed November 1, 2016. http://sites.energetics.com/madri

460 *About MADRI*, Mid-Atlantic Distributed Resources Initiative Working Group, accessed November 1, 2016. http://sites.energetics.com/madri

Since that time, the MADRI Working Group has met to discuss many topics relevant to MEDSIS, including: DERs, storage, distributed resources, integrated distribution planning, and the regulation of distributed resources.[461]

At the most recent meeting (September 2016), the topic for discussion was rate design options in the MADRI states, with a focus on the treatment of distributed energy resources and distributed generation ("DG").[462] MADRI Chairperson Kane attended and opened the meeting and Mr. Daniel Cleverdon from the Commission spoke on the topic "Designing Rates with Distributed Energy Resources in Mind."[463]

10. The National Council on Electricity Policy

The National Council on Electricity Policy ("Council"), Chaired by the Commission's Betty Ann Kane, is a joint venture among the National Conference of State Legislatures ("NCSL"), the National Association of Regulatory Utility Commissioners ("NARUC") and the National Association of State Energy Officials ("NASEO"). The Council was recently part of another collaborative, Eastern Interconnection States Planning Council ("EISPC"). On April 25-26, 2016, EISPC held its annual meeting. Among the presentations given at the meeting was one from the Department of Energy's ("DOE") Grid Modernization Laboratory Consortium ("GMLC"). GMLC's presentation indicated that there are 88 planned projects in the pipeline spanning a 3-year period that would total 220 million.[464]

The multi-year program plan included elements such as: (1) Devices and Integrated Systems, (2) Sensing and Measurement, (3) System Operations and Control, (4) Design and Planning Tools, (5) Security and Resilience, and (6) Institutional Support.[465] The presentation also provided topical areas for regional and state partnerships, including: (1) Resilience, (2) DERs, and (3) Grid Architecture.[466] The topical areas clearly address issues being considered in the MEDSIS Initiative. Finally in a broad sense, the presentation asked five questions, which, if tailored to the discussion of MEDSIS, may be helpful as the Commission moves forward.

1. How can we develop an inclusive functional map of our electricity supply system – one that shows all of the system's interactive components, and how specific parts strongly influence the operation of other parts?

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461 *About MADRI*, Mid-Atlantic Distributed Resources Initiative Working Group, accessed November 1, 2016. http://sites.energetics.com/madri/meetings_2015.html

462 *About MADRI*, Mid-Atlantic Distributed Resources Initiative Working Group, accessed November 1, 2016. .http://sites.energetics.com/madri/meetings_2016.html

463 *About MADRI*, Mid-Atlantic Distributed Resources Initiative Working Group, accessed November 1, 2016. http://sites.energetics.com/madri/meetings_2016.html

464 Department of Energy's ("DOE") Grid Modernization Laboratory Consortium Presentation, at 54.

465 Department of Energy's ("DOE") Grid Modernization Laboratory Consortium Presentation, at 55.

466 Department of Energy's ("DOE") Grid Modernization Laboratory Consortium Presentation, at 55.

2. Looking ahead five years, what are our system's most important strengths and weaknesses?
3. What important changes would we like to see become operational in the next 5-10 years?
4. If we decide to make changes, how can we protect ourselves against the risk of triggering unintended consequences?
5. How can we devise a least-regrets strategy for going forward?[467]

11. The National Association of Regulatory Utility Commissioners

The National Association of Regulatory Utility Commissioners ("NARUC") is a non-profit organization dedicated to representing the State public service commissions who regulate the utilities that provide essential services such as energy, telecommunications, power, water, and transportation. The Commission is a member of NARUC and Commission Staff regularly attend and participate in NARUC meetings and events. On July 21, 2016, NARUC announced that it created a draft *Manual on Distributed Energy Resources ("DER") Compensation*. The draft DER Compensation Manual is the result of a November 11, 2015, resolution adopted at NARUC's Annual Meeting to create a Staff Subcommittee on Rate Design to provide a forum for state commissions to address rate design challenges.[468]

The resolution also recognized the increasing importance of rate design issues in state policy. Organized in five main sections, the Manual describes the basic rate design process and how DER affects that process; defines DER and its relevance for states; identifies the challenges and questions raised by the details of rate design and compensation; outlines a variety of DER compensation methodologies; and provides a description of advanced technologies that may assist regulators and utilities in planning and monitoring DER development. Also, the Manual addresses the rapidly increasing deployment of DER, which includes solar PV, wind, combined heat and power ("CHP"), energy storage, demand response, electric vehicles, microgrids, and energy efficiency. One of the interesting points raised in the Manual is that net metering has created economic pressures, such as utility revenue erosion and cost recovery issues, as well as cost-shifting from net metered to non-metered customers.[469] This is also an important discussion as the Commission considers the further development and regulation of net metering in the District.

NARUC issued a Notice of Town Hall and Comment Period describing the process for input and comments to the draft Manual. The deadline for stakeholders to provide comments on the draft manual was September 2, 2016.[470] The Notice requested that commenters provide feedback on the questions:

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467 Department of Energy's ("DOE") Grid Modernization Laboratory Consortium Presentation, at 56.

468 *NARUC Press Release for the Draft Rate Design Manual and Notice for Town Hall Meeting*, issued July 21, 2016.

469 *NARUC Manual on Distributed Energy Resources ("DER") Compensation*, released July 21, 2016, at 22-27.

470 *NARUC Press Release for the Draft Rate Design Manual and Notice for Town Hall Meeting*, issued July 21, 2016.

1. Has the draft Manual addressed the issue in a comprehensive and useful manner?
2. Are there any other considerations not included in the draft Manual that impact Distributed Energy Resources?
3. Are there other compensation options not included in the draft Manual?
4. How could the Manual be written in a way that is more useful to regulators?
5. Should the draft Manual include a discussion of distribution system planning or distribution system operators?
6. Does the draft Manual provide sufficient discussion on considerations of equitable treatment between customers in the context of ratemaking?
7. Since the initial survey and request for information was released in March 2016, have there been any new developments that the Staff Subcommittee should take into account in this draft Manual?
8. Is the draft Manual missing any key technologies that should be included?[471]

The responses to these questions as well as the general feedback which was incorporated into the final draft of the Manual may be helpful in the Commission's efforts to consider and implement DER in the District.

[471] *NARUC Notice for Town Hall Meeting*, issued July 21, 2016.

APPENDIX C – DEFINITIONS

1. **Behind-the-Meter Generators** – Generator systems restrictively operating in parallel with the electric system that establish interconnection agreements with Pepco or PJM (*i.e.*, gas-fired generator or steam plant). (DCMR §§ 2902, 2903, and 2999).

2. **Cogeneration Facilities** – Systems that produce both: (a) electric energy; and (b) steam or forms of useful energy (such as heat) that are used for industrial, commercial, heating, or cooling purposes. (D.C. Code § 47-1508(a)(12)).

3. **Community Net Metering Credit (CNM Credit)** – The credit realized by the subscriber, based on its ownership share in the CREF. The credit will be reflected on the subscriber's bills from the Electric Company. (DCMR § 999).

4. **Community Renewable Energy Facilities (CREFs)** – This is an arrangement that allows multiple customers to purchase shares or subscriptions in a single renewable energy generating facility (*i.e.*, neighborhood or condominium solar array). The generating facility may not be in proximity to the customer and is in front of the meter, unlike NEM. (D.C. Code §§ 34-1501(9B) and 34-1518.01; DCMR §§ 906, 999 and 4199).

5. **Community-net-metering (CNM) –** A billing arrangement under which the monetary value of electric energy generated by a Community Renewable Energy Facility and delivered to the electric company's local distribution facilities is used to offset electric energy charges accrued during a subscriber's applicable billing period. (D.C. Code § 34-1501, DCMR § 999).

6. **Customer Generation –** Generation that is not principally dedicated for sale into the wholesale electricity market. (DCMR § 2999).

7. **Electric Vehicle –** A vehicle which is powered by an electric motor drawing current from rechargeable storage batteries, fuel cells, or other portable sources of electrical current, and which may include a nonelectrical source of power designed to charge batteries and components thereof. (D.C. Code §§ 50-1501 (12)).

8. **Eligible Customer-Generator –** A customer-generator whose net energy metering system for renewable resources, cogeneration, fuel cells, and microturbines meets all applicable safety and performance standards. (DCMR § 999).

9. **Hybrid Vehicle –** A vehicle propelled by a combination of an electric motor and an internal combustion engine or other power source and components thereof. (D.C. Code §§ 50-1501 (12)).

10. **Market Participant –** Any electricity supplier (including an affiliate of the electric company) or any person providing billing services or services declared by the Commission to be Potentially Competitive Services. (D.C. Code § 34-1501(20)).

11. **Net Energy Billing –** A billing and metering practice under which a customer-generator is billed on the basis of net energy over the billing period. (DCMR § 999).

12. **Net Energy Metering Facilities** - Behind-the-meter ("BTM") generators of 1 MW or less used to offset customer's internal behind the meter loads (usage or consumption). (D.C. Code §§ 34-150(21) and 34-1518; DCMR §§ 900 and 999)

13. **PJM –** Pennsylvania-New Jersey-Maryland Interconnection, LLC, or any successor thereto. (DCMR § 4199).

14. **PJM Interconnection -** The regional transmission organization that is regulated by the Federal Energy Regulatory Commission and functionally controls the transmission system for the region that includes the District of Columbia. (DCMR § 2999).

15. **PJM Interconnection Region –** The area within the movement of wholesale electricity is coordinated by the PJM Interconnection, L.L.C. With respect to qualifying RECs, the following states are deemed within the PJM Interconnection Region as of October 2011; Delaware, the District of Columbia, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. (DCMR § 2999).

16. **Potentially Competitive Service –** A component of electric service (other than electricity supply and billing) determined by the Commission to be suitable for purchase by customers from alternative sellers under § 34-1504(e). (D.C. Code § 34-1501(23)).

17. **Public Purpose Program –** A program implemented with the intention of furthering the public purpose. (D.C. Code § 34-1501(24A)).

18. **Qualified Facilities under PURPA**[472] – These are small power production facilities and cogeneration facilities established by federal law that receive special rate and regulatory treatment.

19. **Renewable Energy Credit (REC) -** A credit representing one megawatt-hour of energy produced by a tier one or tier two renewable source located within the PJM Interconnection region or within a state that is adjacent to the PJM Interconnection region. (D.C. Code 34-1431(10); DCMR § 999 and 2999; Section 3(10) of the Renewable Energy Portfolio Act of 2004, effective April 12, 2005, D.C. Law 15-340).

20. **Renewable Energy Portfolio Standard (REPS) -** The percentage of electricity sales at retail in the District of Columbia that is to be derived from tier one renewable sources and tier two renewable sources in accordance with 34-1432(c). (D.C. Code 34-1431(11); DCMR § 2999)

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472 Public Utility Act of 1978 (PURPA), Pub.L. 95–617, 92 Stat. 3117, enacted November 9, 1978.

21. **Renewable On-site Generator** - A person that generates electricity onsite from a tier one renewable source or tier two renewable source for the person's own use. (D.C. Code 34-1431(12); DCMR § 2999).

22. **SOS Administrator** - Electricity supply made available on and after the initial implementation date to: (1) Customers not yet allowed to choose an electricity supplier under the phase-in of customer choice under § 34-1502; (2) Customers who contract for electricity with an electricity supplier, but who fail to receive delivery of electricity under such contracts; (3) Customers who cannot arrange to purchase electricity from an electricity supplier; and (4) Customers who do not choose an electricity supplier. (D.C. Code 34-1509 (a)(1)-(4); D.C. Code § 34-1501 (25A); DCMR §§ 999 and 4199, Section 109 of the Retail Electric Competition and Consumer Protection Act of 1999, effective May 9, 2000, DC Law 13-107).

23. **Standard Offer Classes -** The customer groupings within the Electric Company's utility territory specified in DCMR 4102.3.[473] (DCMR § 4199).

24. **Standard Offer Service (SOS) –** Provided by the Electric Company from the initial implementation date through February 5, 2005. (D.C. Code §§ 34-1509 (b) and 34-1501(26); DCMR §§ 999 and 4199; Section 109 of the Retail Electric Competition and Consumer Protection Act of May 9, 2000; D.C. Law 13-107)

25. **Standard Offer Service Provider** - Provider of standard offer service chosen pursuant to Chapter 29 of the Commission Rules. (DCMR § 999 and Chapter 29, Renewable Energy Portfolio Standard).

26. **Tier One Renewable Source -** One or more of the following types of energy sources; solar, wind, qualifying biomass, methane from the anaerobic decomposition or organic materials in a landfill or wastewater treatment plant, geothermal, ocean, and fuel cells producing electricity from a tier one renewable source under qualifying biomass and methane. (D.C. Code 34-1431(15); DCMR §§ 999 and 2999, Section 3(15) of the Renewable Energy Portfolio Act of 2004, effective April 12, 2005, D.C. Law 15-340).

27. **Tier Two Renewable Source** – One or more of the following types of energy sources; hydroelectric power other than pumped storage generation, waste-energy, or qualifying

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[473] 15 DCMR § 4102.3 states that "The SOS Administrator shall establish three (3) groups of customers ("SOS Customer Groups"):

(a) Residential Customers shall include customers served under Electric Company Rate Schedules: R, AE, R-TM, R-TM-EX, RAD, and Master Metered Apartment customers, subject to any revisions made to those tariff sheets made by the Commission;

(b) Small Commercial Customers shall include the customers served under Electric Company Rate Schedules: GS-LV non-demand, GS-3A non-demand, T, SL, TS, TN and SL-TN, subject to any revisions made to those tariff sheets made by the Commission; and

(c) Large Commercial Customers shall include all commercial customers except those defined as Small Commercial Customers."

biomass use at a generation unit that started commercial operation on or before December 31, 2006, or achieves a total system, efficiency of less than 65% or uses black liquor. (D.C. Code 34-1431(16), DCMR §§ 999 and 2999).

28. **Wholesale Generators**[474] – Generation facilities that are authorized to participate in the PJM wholesale market.

29. **Wholesale electricity supplier** - The electric company, which, pursuant to § 34-1509, obtains bids from, and contracts for electric service with, third parties and provides standard offer service to retail customers. (D.C. Code §34-1501(29)).

30. **Wholesale Standard Offer Service Provider(s) or "Wholesale SOS Provider(s)" -** The entity(ies) selected pursuant to this chapter to provide all or a specified portion of electric generation service to consumers receiving Standard Offer Service. (DCMR §§ 4100 and 4199).

[474] FERC Glossary Index defines Wholesale Electricity Markets as "[t]he purchase and sale of electricity from generators to resellers (who sell to retail customers) along with the ancillary services needed to maintain reliability and power quality at the transmission level." Available at https://www.ferc.gov/market-oversight/guide/glossary.asp

Additionally, pursuant to the Energy Policy Act of 1992(102nd Congress H.R.776.ENR), this federal legislation created a new class of power generators, exempt wholesale generators, that are exempt from the provisions of the Public Holding Company Act of 1935 and grants the authority to the Federal Energy Regulatory Commission ("FERC") to order and condition access by eligible parties to the interconnected transmission grid. Therefore exempt wholesale generator (EWG) are exempt from certain financial and legal restrictions stipulated in the Public Utilities Holding Company Act of 1935. Available at https://www.congress.gov/bill/102nd-congress/house-bill/776/text/enr

APPENDIX D – WORKSHOP PARTICIPATION DETAILS

Below, Staff provides: (1) a complete list of all Stakeholders who gave presentations at the workshops held in this proceeding; and (2) a complete citation list of all comments filed in the Formal Case No. 1130 docket, these comments are also available for review and print on the Commission's eDocket by visiting our website www.dcpsc.org/medsis.[475]

TABLE 10: LIST OF FORMAL CASE NO. 1130 WORKSHOP PRESENTERS

LIST OF FORMAL CASE NO. 1130 WORKSHOP PRESENTERS

October 1, 2015 – Kick-Off Workshop

1. District of Columbia Department of Energy & Environment
2. United States General Services Administration
3. Washington Gas Light Company
4. Potomac Electric Power Company
6. Downtown DC Business Improvement District

November 19, 2016 – Second Workshop

1. Urban Ingenuity
2. Grid Energy
3. Washington Gas Energy Systems
4. Downtown DC Business Improvement District
5. MD-DC-VA Solar Energy Industries Association
6. Georgetown University (LAWJ-1019-05 Practicum)
7. Thinkbox Group
8. DC Water
9. SKANSKA
10. District Department of General Services

April 28, 2016 – Third Workshop

1. Washington Gas Light Energy
2. Grid Energy
3. PJM Interconnection LLC
4. Solar City
5. Institute of Electrical and Electronics Engineers
6. American Council for an Energy-Efficient Economy
7. United States General Services Administration
8. District of Columbia Department of Energy & Environment
9. Urban Ingenuity
10. Georgetown Climate Center
11. westMONROE
12. U.S. Department of Energy
13. ICF

[475] Interested persons can also access the presentations and archived video recordings of the workshops by visiting the "MEDSIS Initiative" webpage within the Commission's website at: http://www.dcpsc.org/medsis.

LIST OF FORMAL CASE NO. 1130 WORKSHOP PRESENTERS

14. Pennoni Associates
15 Potomac Electric Power Company
16 Energy Storage Association
17. Advanced Energy Group
18. MORE THAN SMART

TABLE 11: LIST OF COMMENTS FILED IN FORMAL CASE NO. 1130

LIST OF COMMENTS FILED IN FORMAL CASE NO. 1130

A-1 *Formal Case No. 1130*, Grid Energy, LLC Comments, filed August 29, 2016.

A-2 *Formal Case No. 1130*, EnerNOC, Inc. Comments, filed August 22, 2016.

A-3a *Formal Case No. 1130*, Grid 2.0 Working Group, DC Climate Action, DC Environmental Network, and Chesapeake Climate Action Network Comments to Order No. 18144, filed July 25, 2016.

A-3b *Formal Case No. 1130*, Grid 2.0 Working Group Comments to Order No. 18144, filed April 18, 2016.

A-3c *Formal Case No. 1130*, Grid 2.0 Chair Robert Robinson Comments, filed April 18, 2016.

A-3d *Formal Case No. 1130*, Grid 2.0 Working Group, DC Environmental Network, DC Chapter of Sierra Club, and DC Consumer Utility Board Initial Comments, filed August 31, 2015.

A-4a *Formal Case No. 1130*, Advanced Energy Economy Institute, filed June, 16, 2016.

A-4b *Formal Case No. 1130*, Advanced Energy Economy, filed April 18, 2016.

A-5a *Formal Case No. 1130,* District of Columbia Government Supplemental Comments, filed May 24, 2016.

A-5b *Formal Case No. 1130,* District of Columbia Government Comments to Order No. 18144, filed April 18, 2016.

A-5c *Formal Case No. 1130,* District of Columbia Government Initial Comments, filed August 31, 2015.

A-6a *Formal Case No. 1130,* NRG Energy Inc. Comments to Order No. 18144, filed May 13, 2016.

A-6b *Formal Case No. 1130,* NRG Energy Inc. Initial Comments, filed November 20, 2015.

A-7 *Formal Case No. 1130,* The Microgrid Resources Coalition by Drinker, Biddle and Reath, filed May 11, 2016.

A-8a *Formal Case No. 1130,* DC Climate Action Comments to Order No. 18144, filed April 19, 2016.

A-8b *Formal Case No. 1130,* DC Climate Action Initial Comments, filed September 1, 2015.

A-9 *Formal Case No. 1130,* Pennoni and Associate’s Comments to Order No. 18144, filed April 18, 2016.

LIST OF COMMENTS FILED IN FORMAL CASE NO. 1130

A-10 *Formal Case No. 1130*, Urban Ingenuity Comments to Order No. 18144, filed April 18, 2016.

A-11a *Formal Case No. 1130*, Potomac Electric Power Company Comments to Order No. 18144, filed April 18, 2016.

A-11b *Formal Case No. 1130*, Potomac Electric Power Company Initial Comments, filed August 31, 2015.

A-12a *Formal Case No. 1130*, U.S. General Services Administration Comments to Order No. 18144, filed April 18, 2016.

A-12b *Formal Case No. 1130*, U.S. General Services Administration Initial Comments, filed August 31, 2015.

A-13a *Formal Case No. 1130*, Washington Gas Light Comments to Order No. 18144, filed April 18, 2016.

A-13b *Formal Case No. 1130*, Washington Gas Light Company Initial Comments, filed August 31, 2015.

A-14a *Formal Case No. 1130*, DC Solar United Neighborhoods Comments to Order No. 18144, filed April 18, 2016.

A-14b *Formal Case No. 1130*, DC Solar United Neighborhoods Initial Comments, August 31, 2015.

A-15a *Formal Case No. 1130*, Office of the People's Counsel Comments to Order No. 18144, filed April 18, 2016.

A-15b *Formal Case No. 1130*, Office of the People's Counsel Initial Comments, filed August 31, 2015.

A-16 *Formal Case No. 1130*, MDV-SEIA Comments to Order No. 18144, filed April 18, 2016.

A-17 *Formal Case No. 1130*, Sonnen, Inc. Comments to Order No. 18144, filed April 18, 2016.

A-18a *Formal Case No. 1130*, Washington Gas Energy Services, Inc. Comments to Order No. 18144, filed April 18, 2016.

A-18b *Formal Case No. 1130*, Washington Gas Energy Services, Inc. Initial Comments, filed August 31, 2015.

A-19a *Formal Case No. 1130*, SolarCity Inc. Comments to Order No. 18144, filed April 18, 2016.

A-19b *A Pathway to the Distributed Grid: Evaluating the economics of distributed energy resources and outlining a pathway to capturing their potential value*, SolarCity, Inc., April 18, 2016. (http://www.solarcity.com/sites/default/files/SolarCity_Distributed_Grid.pdf)

A-19c *Formal Case No. 1130*, SolarCity, Inc. Initial Comments, filed September 4. 2015.

A-20 Jim Rossi, *Federalism and the Net Metering Alternative*, Electricity Journal (2016).

LIST OF COMMENTS FILED IN FORMAL CASE NO. 1130

A-21a Michael Overturf, *A Framework For Economic Competition in Electricity Distribution Services*, DC Public Power, file November 19, 2015.

A-21b *Formal Case No. 1130*, DC Public Power Initial Comments, filed August 31, 2015.

A-22 *Formal Case No. 1130*, The George Washington University Law School Sustainable Energy Initiative, filed October 13, 2015.

A-23 *Formal Case No. 1130*, Quanta Technology, Inc. Comments, filed October 1, 2015.

A-24 *Formal Case No. 1130*, Underwriters Laboratories, Inc., filed September 18, 2015.

A-25 *Formal Case No. 1130*, SemaConnect, Inc. Comments, filed September 11, 2015.

A-26 *Formal Case No. 1130*, The Climate Group, filed September 3, 2015.

A-27 *Formal Case No. 1130*, TESLA, filed September 3, 2015.

A-28 *Formal Case No. 1130,* Wal-Mart Stores East, L.P., and Sam's East Inc. Comments, filed September 3, 2015.

A-29 *Formal Case No. 1130,* National Electrical Manufacturers Association, filed September 1, 2015.

A-30 *Formal Case No. 1130,* Northeast Energy Efficiency Partnerships, filed August 31, 2015.

A-31 *Formal Case No. 1130,* Downtown Business Improvement, filed August 31, 2015.

A-32 *Formal Case No. 1130,* Smarter Grid Solutions, filed August 31, 2015.

A-33 *Formal Case No. 1130,* New York University of Law Institute for Policy Integrity, filed August 31, 2015.

A-34 *Formal Case No. 1130,* Energy Storage Association, Policy and Advocacy Comments, filed August 31, 2015.

A-35 *Formal Case No. 1130*, Harvard Law School, Emmett Environment Law and Policy Clinic, filed August 31, 2015.

A-36 *Formal Case No. 1130*, Dominion Voltage Inc. and Dominion Energy Technology, Inc. Comments, filed August 31, 2015.

A-37a *Formal Case No. 1130*, Mission:data Coalition, filed August 26, 2016.

A-37b *Formal Case No. 1130*, Mission:data Coalition, filed August 31, 2015.

A-38 *Formal Case No. 1130*, Renewable Energy Systems Americas Inc., filed August 31, 2015.

A-39 *Formal Case No. 1130*, PJM Interconnection, filed August 31, 2015.

APPENDIX E – DRAFT NOTICE OF PROPOSED RULEMAKING

PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

NOTICE OF PROPOSED RULEMAKING

FORMAL CASE NO. 1130, IN THE MATTER OF THE INVESTIGATION INTO MODERNIZING THE ENERGY DELIVERY SYSTEM FOR INCREASED SUSTAINABILITY;

RM-09-2017-01, IN THE MATTER OF 15 DCMR CHAPTER 9 — NET ENERGY METERING;

RM-13-2017-01, IN THE MATTER OF 15 DCMR CHAPTER 13 — RULES IMPLEMENTING THE PUBLIC UTILITIES REIMBURSEMENT FEE ACT OF 1980;

RM-29-2017-01, IN THE MATTER OF 15 DCMR CHAPTER 29 — RENEWABLE ENERGY PORTFOLIO STANDARD;

RM-36-2017-01, IN THE MATTER OF 15 DCMR CHAPTER 36 — ELECTRICITY QUALITY OF SERVICE STANDARDS;

RM-40-2017-01, IN THE MATTER OF 15 DCMR CHAPTER 40 — DISTRICT OF COLUMBIA SMALL GENERATOR INTERCONNECTION RULES;

RM-41-2017-01, IN THE MATTER OF 15 DCMR CHAPTER 41 — THE DISTRICT OF COLUMBIA STANDARD OFFER SERVICE RULES;

RM-42-2017-01, IN THE MATTER OF 15 DCMR CHAPTER 42 — FUEL MIX AND EMISSIONS DISCLOSURE REPORTS; AND

RM-44-2017-01, IN THE MATTER OF 15 DCMR CHAPTER 44 — SUBMETERING AND ENERGY ALLOCATION.

1. The Public Service Commission of the District of Columbia ("Commission") hereby gives notice, pursuant to Section 34-802 of the District of Columbia Code ("D.C. Code") and in accordance with Section 2-505 of the D.C. Code,[476] of its intent to amend the following provisions of Title 15 (Public Utilities and Cable Television) of the District of Columbia Municipal Regulations ("DCMR"): Chapter 9, "Net Energy Metering;" Chapter 13, "Rule Implementing the Public Utilities Reimbursement Fee Act of 1980;" Chapter 29, "Renewable Energy Portfolio Standard;" Chapter 36, "Electric Quality of Service Standards;" Chapter 40, "District of Columbia Small Generator Interconnection Rules;" Chapter 41, "The District of Columbia Standard Offer Service Rules;" Chapter 42, "Fuel Mix and Emissions Disclosure

476 D.C. Code § 34-802 (2001); D.C. Code § 2-505 (2001).

Reports;" and Chapter 44, "Submetering and Energy Allocation." Amendments to the above referenced Chapters shall take effect in not less than sixty (60) days from the date of publication of this Notice of Proposed Rulemaking ("NOPR") in the *D.C. Register*.

2. The Government of the District of Columbia has established a clear policy of encouraging the deployment of Distributed Energy Resources ("DER"), including distributed generation, such as solar energy and cogeneration facilities both standing alone as well as part of microgrids. As deployment of distributed generation ("DG") expands and adjusts to meet demand, the Commission must examine how it can best use its regulatory authority to support the District's energy goals while simultaneously adhering to current statutes that prohibit the construction of generators and the sale of electricity without first obtaining Commission approval.

3. On March 17, 2016, in Order No. 18144, the Commission sought comments on more general but related questions concerning distributed generation deployment and the nature of a retail sale. These comments were considered by Staff and summarized in the Modernizing the Energy Delivery System for Increased Sustainability ("MEDSIS") Staff Report, issued in *Formal Case No. 1130* on January 25, 2017. In the MEDSIS Staff Report, Commission Staff also identifies various potential regulatory issues that create uncertainty in the deployment of new technologies on the District's natural gas and electricity distribution grids and provides recommended actions to address the issues identified. Most notably, Staff recommends that the Commission adopt and amend pertinent DER related definitions in our regulations in order to establish a consistent language for addressing the complex issues related to modernizing the District's energy systems, especially as it relates to DER deployment, going forward.

4. This NOPR, along with NOPRs issued concurrently concerning Chapter 46 "Electric Supplier Licensing" and Chapter 21 "Provisions for Construction of Electric Generating Facilities and Transmission Lines," aim to eliminate regulatory ambiguity. Further, establishing a consistent set of definitions will facilitate public input into the evolution of the Districts energy systems.

Section 999 of Chapter 9, Section 4199.1 of Chapter 41, and Section 4299.1 of Chapter 42, are amended to include the following:

> "**Electric company**" includes every corporation, company, association, joint-stock company or association, partnership, or person doing business in the District of Columbia, their lessees, trustees, or receivers appointed by any court whatsoever, physically transmitting or distributing electricity in the District of Columbia to retail electric customers, excluding any person or entity distributing electricity from a behind-the-meter generator to a single retail customer behind the same meter. In addition, the term excludes any building owner, lessee, or manager who, respectively, owns, leases, or manages, the internal distribution system serving the building and who supplies electricity and other electricity related services solely to the occupants of the building for use by the occupants. The term also excludes a Person or entity that does not sell or

distribute electricity and that owns or operates equipment used exclusively for the charging of electric vehicles.

In Section 999 of Chapter 9, Section 1399.1 of Chapter 13, Section 2999.1 of Chapter 29, Section 3699.1 of Chapter 36, Section 4199.1 of Chapter 41, Section 4299.1 of Chapter 42, and Section 4499.1 of Chapter 44, the definitions for "electricity supplier" or "competitive electricity supplier" are amended as follows:

"**Electricity supplier**" or "**competitive electricity supplier**" means a person, including an Aggregator, Broker, or Marketer, who generates electricity; sells electricity; or purchases, brokers, arranges or markets electricity or electric generation services for sale to customers. The term excludes the following:

(A) Building owners, lessees, or managers who manage the internal distribution system serving such building and who supply electricity solely to the occupants of the building for use by the occupants;

(B) Any Person who purchases electricity for its own use or for the use of its subsidiaries or affiliates;

(C) Any apartment building or office building manager who aggregates electric service requirements for his or her building or buildings, and who does not: (I) Take title to electricity; (II) Market electric services to the individually-metered tenants of his or her building; or (III) Engage in the resale of electric services to others;

(D) Property owners who supply small amounts of power, at cost, as an accommodation to lessors or licensees of the property;

(E) Consolidators;

(F) Community Renewable Energy Facilities (CREFs) as defined in Section 4199.1 and as described in Sections 4109.1 through 4109.3 pursuant to the Community Renewable Energy Amendment Act of 2013;

(G) An Electric Company;

(H) Nontraditional Marketers; and

(I) Any person or entity that owns a behind-the-meter generator and sells or supplies the electricity from that generator to a single retail customer or customers behind the same meter.

In Section 999 of Chapter 9, Section 1399.1 of Chapter 13, Section 3699.1 of Chapter 36, Section 4199.1 of Chapter 41, Section 4299.1 of Chapter 42, and Section 4499.1 of Chapter 44, the definition for "behind the meter generator" is added to clarify the meaning of "electricity supplier" as follows:

"**Behind-the-meter generator**" – a renewable on-site generator that is located behind a retail customer's meter such that no electric company-owned transmission or distribution facilities are used to deliver the energy from the generating unit to the on-site load**.**

Section 999.1 of Chapter 9, and Section 4099.1 of Chapter 40, are amended to include the following:

"**Battery**" – A device that is able to store electrical energy in the form of chemical energy, and convert that energy into electricity.

"**Back-up generation**" – Any electric generating facility, as defined in D.C. Code Section 34-205, which is connected to the electric distribution system in the District of Columbia and not subject to the Commission's Small Generator Interconnection Rules because it does not operate parallel to the electric distribution system.

"**Cogeneration facility**" or "**combined heat and power (CHP) facility**" – A system that produces both electric energy, steam, or other forms of useful energy (such as heat) that are used for industrial, commercial, heating, or cooling purposes.

"**Demand response**" – A reduction in the consumption of electric energy by customers from their expected consumption in response to either an increase in the price of electric energy or to incentive payments designed to induce lower consumption of electric energy.

"**Distributed energy resource**" **or "DER"** – A resource sited close to the customer's load that can provide all or some of the customer's energy needs and can also be used by the system to either reduce demand (such as demand response) or increase supply to satisfy the energy or ancillary service needs of the distribution system. The resources, if providing electricity or thermal energy, are small in scale, connected to the distribution system, and close to the load. Types of DER include, but are not limited to: photovoltaic solar, wind, cogeneration, energy storage, demand response, electric vehicles, microturbines, and energy efficiency.

"**Distributed generation**" – Any electric generating facility, as defined in D.C. Code Section 34-205, which is connected to the electric distribution system in the District of Columbia and subject to the Commission's Small Generator Interconnection Rules.

"**Electric vehicle**" – A vehicle which is powered by an electric motor drawing current from rechargeable storage batteries, fuel cells, or other portable sources of electrical current, and which may include a non-electrical source of power designed to charge batteries and components thereof.

"**Electric storage**" – A resource capable of receiving electric energy from the grid and storing it for later injection of electrical energy back to the grid regardless of where the resource is located on the electric distribution system. These resources include all types of electric storage technologies, regardless of their size, storage medium (*e.g.*, batteries, flywheels, electric vehicles, compressed air), or operational purpose.

"**Fly-wheel**" – A device that is able to store electrical energy in the form of kinetic energy, and convert that energy into electricity.

"**Fossil fuel generator**" – Any electric generating facility that utilizes coal, natural gas, or any other petroleum product as a fuel.

"**Fuel cell**" – A device that produces electricity through a chemical reaction between a source fuel and an oxidant.

"**Microgrid**" – A collection of interconnected loads, generation assets, and advanced control equipment, installed across a limited geographic area and within a defined electrical boundary that is capable of disconnecting from the larger electric distribution system. A microgrid may serve a single customer with several structures or serve multiple customers. A microgrid can connect and disconnect from the distribution system to enable it to operate in both interconnected or island mode.

"**Microturbine**" – A small combustion turbine with an output of 25 kW to 500 kW.

In Section 999.1 of Chapter 9, the definition of "eligible customer generator" is amended as follows to clarify that the term is synonymous with the term "net energy metering facility":

"**Eligible customer-generator**" or "**net energy metering facility**" means a customer-generator whose net energy metering system for renewable resources, cogeneration, fuel cells, and or microturbines meets all applicable safety and performance standards.

5. The MEDSIS Staff Report may be reviewed at the Office of the Commission Secretary, Public Service Commission of the District of Columbia, 1325 G Street, N.W., Suite 800, Washington, D.C. 20005, between the hours of 9:00 a.m. and 5:30 p.m., Monday through Friday as well as on the Commission's web site at www.dcpsc.org. Once at the website, open the "EDOCKET SYSTEM" tab, click on the "Search Current Dockets" and input "FC1130" as the case number and "XXA"[477] as the item number. Copies of the MEDSIS Staff Report are also available upon request, at a per-page reproduction cost, by contacting the Commission Secretary at (202) 626-5150 or psc-commissionsecretary@dc.gov.

6. All persons interested in commenting on content of this NOPR are invited to submit written comments and reply comments no later than sixty (60) and thirty (30) days, respectively, after the publication of this NOPR in the *D.C. Register*. Written comments should be filed with: Brinda Westbrook-Sedgwick, Commission Secretary, Public Service Commission of the District of Columbia, 1325 G Street, N.W., Suite 800, Washington, D.C. 20005, submitted

[477] "XXA" serves as a placeholder for the actual item number that will be assigned to the MEDSIS Staff Report in the Formal Case No. 1130 docket.

via email to psc-commissionsecretary@dc.gov, or through the Commission's website at http://edocket.dcpsc.org/comments/submitpubliccomments.asp.

APPENDIX F – DRAFT NOTICE OF PROPOSED RULEMAKING

PUBLIC SERVICE COMMISSION OF THE DISTRICT OF COLUMBIA

NOTICE OF PROPOSED RULEMAKING

FORMAL CASE NO. 1130, IN THE MATTER OF THE INVESTIGATION INTO MODERNIZING THE ENERGY DELIVERY SYSTEM FOR INCREASED SUSTAINABILITY; AND

RM21-2017-01, IN THE MATTER OF 15 DCMR CHAPTER 21-PROVISIONS FOR CONSTRUCTION OF ELECTRIC GENERATING FACILITES AND TRANSMISSION LINES

1. The Public Service Commission of the District of Columbia (Commission), pursuant to its authority under D.C. Official Code §§ 34-301, 34-302, 34-802, and 34-1516 (2001) (D.C. Code) and in accordance with D.C. Code § 2-505, hereby gives notice of its intent to amend Chapter 21, "Provisions for Construction of Electric Generating Facilities and Transmission Lines," of Title 15 (Public Utilities and Cable Television) of the District of Columbia Municipal Regulations, in not less than 30 days after publication of this notice in the *D.C. Register*.

2. The Government of the District of Columbia has established a clear policy of encouraging the deployment of Distributed Energy Resources (DER), including distributed generation (DG), such as solar energy facilities, microturbines, and cogeneration both as standalone as well as part of microgrids. As deployment of distributed generation expands and adjusts to meet demand, the Commission must examine how it can best use its broad regulatory authority to support the District's energy goals while simultaneously adhering to current statutes that prohibit the construction of generators and sale of electricity without first obtaining Commission approval.

3. On March 17, 2016, in Order No. 18144, the Commission sought comments on more general but related questions concerning distributed generation deployment and the nature of a retail sale. These comments were considered by Staff and summarized in the Modernizing the Energy Delivery System for Increased Sustainability (MEDSIS) Staff Report, issued in *Formal Case No. 1130* on January 25, 2017. In the MEDSIS Staff Report, Commission Staff also identifies various potential regulatory issues that create uncertainty in the deployment of new technologies on the District's natural gas and electricity distribution grids and provides recommended actions to address the issues identified. Most notably, Staff recommends that the Commission adopt and amend pertinent DER-related definitions in our regulations in order to establish a uniform language for addressing the complex issues related to modernizing the District's energy systems, especially as it relates to DER deployment, going forward.

4. This NOPR, along with NOPRs published concurrently concerning Chapters 9, 13, 29, 36, 40, 41, 42, and 44, work to eliminate any regulatory ambiguity. Finally, the definition of qualifying biomass in these Chapter 21 draft rules differs from the definitions of Tier I and Tier II qualifying biomass in the Commission's Chapter 29 rules governing the

District's Renewable Energy Portfolio Standard (REPS).[478] The Chapter 29 definitions of Tier I and Tier II qualifying biomass are in turn based on the statutory provisions for REPS in D.C. Code 34-1431 (2016 Supp.). The Commission's purpose in revising these construction rules is to promote the development of distributed generation and renewable energy as a general matter, while the District's REPS provides specific goals and financial incentives for the development of various renewable energy types. The definitions of biomass in this NOPR and Chapter 29 differ accordingly.

Chapter 21 of Title 15 of the DCMR is amended as follows:

2100 APPLICABILITY

Section 2100.1 is amended in its entirety to read as follows:

2100.1 This Chapter shall govern the construction of all electric generating facilities the electricity generated from which will be sold regardless of capacity, overhead transmission lines designed to carry sixty-nine thousand (69,000) volts or more, underground transmission lines in excess of sixty-nine thousand (69,000) volts as well as any substations connected to such lines.

Section 2100.2 is amended in its entirety to read as follows:

2100.2 No person shall construct an electric generating facility the electricity generated from which will be sold regardless of capacity, unless the Commission first determines, after notice and a hearing that the construction of the facility is in the public interest. Nor shall any person construct an overhead transmission line designed to carry sixty-nine thousand (69,000) volts or greater, or substation connected to such line, unless the project has been approved in accordance with this Chapter. Unless specifically required by law or other provision of this Chapter, Commission approval shall not be required for the routine repair and replacement activities necessary to maintain an electric generating facility or transmission line.

2101 APPLICATION FILING REQUIREMENTS FOR THE CONSTRUCTION OF FOSSIL FUEL, EXCEPT FOR MICROTURBINE, AND WASTE-TO-ENERGY ELECTRIC GENERATING FACILITIES. TRANSMISSION LINES, AND SUBSTATION CONNECTED TO TRANSMISSION LINE

Section 2101.1 is amended in its entirety to read as follows:

An application for approval of the construction of a fossil fuel (except for a microturbine) or waste-to-energy generating facility, transmission line, or substation covered under this Chapter shall include the following information:

(a) The name and address of the principal place of business of the applicant;

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478 *See* 15 DCMR § 2999.1 (2008, 2012, and 2016).

(b) The name, title, and address of the person authorized to receive notices and communications with respect to the application;

(c) The location or locations where the public may inspect or obtain a copy of the application;

(d) A list of each District of Columbia, state, or federal government agency having authority to approve or disapprove the construction or operation of the project and containing the following:

  (1) A statement indicating whether the necessary approval from each agency has been obtained, with a copy of each approval or disapproval attached;

  (2) A statement indicating the circumstances under which any necessary approval has not been obtained; and

  (3) A statement indicating whether any waiver or variance has been requested, with a copy of each approval or disapproval attached.

(e) A general description of the generating station under § 2102, or the transmission line under § 2104, and the alternatives considered under §§ 2103 and 2104, respectively;

(f) The environmental information required under § 2108;

(g) A statement of the engineering justifications for the project;

(h) A statement of the safety considerations incorporated into the design, construction, and maintenance of the project;

(i) A statement of the socioeconomic impact of the project;

(j) A statement of contacts with community groups and the affected community;

(k) A statement that the applicant has complied with all applicable environmental and zoning laws; and

(l) A statement that the applicant has complied or will comply with the applicable PJM Interconnection, L.L.C. (PJM) tariff and requirements for the interconnection of new and expanded electric generating facilities within the PJM transmission system.

2102 DESCRIPTION OF FOSSIL FUEL (EXCEPT FOR MICROTURBINE) OR SOLID WASTE ELECTRIC GENERATING FACILITY

Section 2102.1 is amended in its entirety to read as follows:

2102.1 The description of the fossil fuel (except for microturbine) or waste-to-energy generating facility shall include the following:

(a) Location;

(b) All important design and engineering features, including fuel requirements, heat rates, emission rates, space requirements, transportation facilities, water requirements, and transmission requirements;

(c) Operational features, including operation and maintenance personnel and equipment;

(d) The schedule for engineering, construction, and operation of the generating stations;

(e) The impact of the proposed generating station on system operations, reliability, reserve margins, and capacity factors;

(f) A statement of the reasons for the selection of the design and the site of the generating facility, including the location and identification of the following sites from which the project would be clearly visible:

(1) Residential structures;

(2) Historical structure and land sites;

(3) Institutional land, including school hospitals, and pre-school facilities;

(4) Recreational area;

(5) Aesthetic;

(6) Archaeological;

(7) Wildlife management area; and

(8) Park or forest.

2103 ALTERNATIVE FOSSIL FUEL (EXCEPT FOR MICROTURBINE) OR WASTE-TO-ENERGY GENERATING FACILITY

Section 2103.1 is amended in its entirety to read as follows:

2103.1 The description of each alternative design or site considered for a fossil fuel (except for a microturbine) or waste-to-energy generating facility shall include the following:

The reasons for rejecting each alternative design or site.

2106 PROJECT COORDINATING COMMITTEE FOR FOSSIL FUEL (EXCEPT FOR MICROTURBINE) OR WASTE-TO-ENERGY GENERATING FACILITY, TRANSMISSION LINE, OR SUBSTATION CONNECTED TO TRANSMISSION LINE APPLICANT

Section 2106.1 is amended in its entirety to read as follows:

2106.1 Once an application for a fossil fuel (except for a microturbine) or waste-to-energy generating facility, transmission line, or substation connected to transmission line has been properly filed, the applicant may request the formation of a project coordinating committee. If the request is approved, the Committee shall consist of the following members:

(a) A chairperson, who shall be designated by the Commission;

(b) A representative of the applicant;

(c) A representative from the Office of the People’s Counsel, if a notice of intent to participate on the committee is filed within ten (10) days of the date of the filing of a request to form a project coordinating committee;

(d) A representative from each District of Columbia agency that has as follows:

(1) Authority to issue a license, permit, or authorization before the construction or operation of the project; or

(2) A direct interest in the project.

(e) Pepco, if Pepco is not the applicant.

(f) A representative designated by the Executive Office of the Mayor; and

(g) A representative of any federal agency or independent system operator that, in the Commission’s view, has an interest in the project.

2107 COMMUNITY ADVISORY GROUP

Section 2107.1 is amended in its entirety to read as follows:

2107.1 In order to inform and educate the community regarding the construction and operation of any proposed fossil fuel or waste-to-energy project, the applicant shall convene a community advisory group.

2108 ENVIRONMENTAL IMPACT STATEMENT FOR FOSSIL FUEL, EXCEPT FOR MICROTURBINE, OR WASTE-TO-ENERGY GENERATING FACILITY, TRANSMISSION LINE, OR SUBSTATION CONNECTED TO TRANSMISSION LINE

Section 2108.1 is amended in its entirety to read as follows:

2108.1 The applicant for a fossil fuel (except for a microturbine) or waste-to-energy generating facility, transmission line, or substation connected to transmission line shall submit an Environmental Impact Statement (EIS). At a minimum, the EIS shall evaluate the following potential environmental impacts:

(a) Air quality, National Ambient Air Quality Standards (NAAQS). The analysis of air quality shall include an analysis of the following six (6) criteria pollutants in the context of NAAQS:

(1) Sulfur dioxide;

(2) Nitrogen oxides;

(3) Carbon monoxide;

(4) Particulate matter (PM 2.5 and PM10);

(5) Ozone; and

(6) Lead.

(b) Air Quality, other emissions: The analysis of air quality shall include all other emissions regulated for the utility industry under the Federal Clean Air Act;

(c) Surface and ground water resources. The analysis of surface and ground water resources shall include the following:

(1) Water availability; and

(2) Water quality, including discharge, storm water runoff, and potential spill events.

(d) Land use, socioeconomic, and aesthetic conditions: The analysis of these items shall evaluate, at a minimum, the following:

(1) Appropriate zoning and compatibility with adjacent land use;

(2) Impact on traffic;

(3) Impact on cultural and historical resources; and

(4) Visibility impacts in terms of air pollution effects and aesthetics.

(e) Noise conditions: The analysis of noise shall include the following:

(1) A complete review of standards that will be met;

(2) The points of measurement for noise impacts;

(3) A comparison of the impact of the action to common outdoor sounds at that location; and

(4) A complete explanation of the methodology used for the noise impact measurements.

(f) Aquatic and terrestrial ecology resources: The analysis of aquatic and terrestrial ecology shall evaluate the impact upon the following:

(1) Fish;

(2) Wildlife;

(3) Vegetation; and

(4) Direct discharges into surface waters and impact on wetland habitats; and

(g) Electric and magnetic fields (EMF): Until applicable laws governing EMF are enacted, the applicant shall submit the following information:

(1) An update of the general research on the health effects of EMF;

(2) The relationship of the proposed action to the increase or decrease of EMF, including any mitigating measures that could be employed to decrease EMF;

(3) The applicant's efforts to measure and better understand background EMF in the communities affected by the proposed action; and

(4) If and when laws are enacted, then the EIS shall demonstrate compliance with all applicable laws.

2109 PHASED PROCEEDINGS ON THE APPLICATION FOR FOSSIL FUEL (EXCEPT FOR MICROTURBINE) OR WASTE-TO-ENERGY GENERATING FACILITY, TRANSMISSION LINE, OR SUBSTATION CONNECTED TO TRANSMISSION LINE

2109.1 The applicant for a fossil fuel (except for a microturbine) or waste-to-energy generating facility, transmission line, or substation connected to transmission line may request, or the Commission may on its own initiative direct, that the construction project be reviewed in two (2) or more phases.

The previous Section 2111, UNDERGROUND TRANSMISSION LINES IN EXCESS OF SIXTY-NINE THOUSAND VOLTS AND SUBSTATIONS CONNECTED TO SUCH LINES, is renumbered Section 2110

Add a new Section 2111, APPLICATION FILING REQUIREMENTS FOR THE CONSTRUCTION OF RENEWABLE ENERGY, MICROTURBINE, COMBINED HEAT AND POWER, AND FUEL CELL ELECTRIC GENERATING FACILITIES, to read as follows:

2111.1 An application for approval of the construction of a renewable energy, microturbine, combined heat and power, or fuel cell electric generating facility covered under this Chapter shall include the following information:

(a) The name, if any, and address of the facility;

(b) The name and address of the owner of the facility;

(c) The name and address of the operator of the facility;

(d) The name and address of the contact person;

(e) Fuel types:

(1) Solar energy, describe the system (photovoltaic or thermal; manufacturer/supplier; model name/number; system orientation, tilt and azimuth; and type of meter, including model number and name);

(2) Wind;

(3) Qualifying biomass;

(4) Methane from the anaerobic decomposition of organic materials in a landfill or wastewater treatment plant;

(5) Geothermal;

(6) Ocean, including energy from waves, tides, currents, and thermal differences;

(7) Fuel cells (identify source fuel);

(8) Fossil fuel type (for microturbine only);

(9) Hydroelectric power other than pumped storage;

(10) Liquid biofuels, including ethanol, biodiesel (vegetable oils and liquid animal fats), green diesel (derived from algae, grass, and other plant sources), and biogas (methane derived from animal manure and other digested organic material).

(f) Rated capacity in MW, to one decimal place, or in KW;

(g) Operational start date or date of approved interconnection with Pepco; and

(h) Whether the facility is a behind-the-meter generator.

2111.2 Unless an objection is filed in response to an application under this subsection or the Commission issues a procedure schedule to further consider the application within 20 business days, an application shall be deemed approved.

The previous Section 2110, ANNUAL REPORT ON SMALLER SCALE CONSTRUCTION, is renumbered Section 2112

The previous Section 2112, WAIVERS AND MODIFICATIONS, is renumbered Section 2113

2199 DEFINITIONS

The following definitions are added to Subsection 2199.1:

"Brush" means shrubs and stands of short, scrubby trees that do not reach merchantable size.

"Combined heat and power facility" means a system that produces both electric energy and steam or forms of useful energy (such as heat) that are used for industrial, commercial, heating, or cooling purposes.

"Dunnage" means loose materials or padding used to support or protect cargo within shipping containers.

"Fuel cell" means a device that produces electricity through a chemical reaction between a source fuel and an oxidant.

"Microturbine" means a small combustion turbine with an output of 25 kW to 500 kW.

"Qualifying biomass" means a solid, non-hazardous, cellulosic waste material that is segregated from other waste materials, and is derived from any of the following forest- related resources, with the exception of old growth timber, unsegregated solid waste, or post-consumer wastepaper:

(a) Mill residue;

(b) Precommercial soft wood thinning;

(c) Slash;

(d) Brush;

(e) Yard waste;

(f) A waste pallet, crate, or dunnage;

(g) Agricultural sources, including tree crops, vineyard materials, grain, legumes, sugar, and other crop by products or residues; or

(h) Cofired biomass.

"Slash" means:

(a) Tree tops, branches, bark, or other residue left on the ground after logging or other forestry operations; or

(b) Tree debris left after a natural catastrophe.

"Solar energy" means radiant energy, direct, diffuse, or reflected, received from the sun at wavelengths suitable for conversion into thermal, chemical, or electrical energy.

"Waste-to-energy" means waste treatment, including the use of a licensed facility that burns waste resources in high-efficiency furnaces/boilers, to produce electricity. Such resources include municipal solid waste and non-qualifying biomass but exclude waste coal.

5. Any person interested in commenting on the subject matter of this NOPR may submit written comments and reply comments 30) and 45 days, respectively, after the publication of this Notice in *D.C. Register*. Comments and reply comments are to be addressed to Brinda Westbrook-Sedgwick, Commission Secretary, Public Service Commission of the District of Columbia, 1325 G Street, N.W., Suite 800, Washington D.C., 20005, via email to psc-commissionsecretary@dc.gov, or through the Commission's website at

http://edocket.dcpsc.org/comments/submitpubliccomments.asp. After the comment period expires, the Commission will take final rulemaking action.