Modernizing the Energy Delivery System for Increased Sustainability

Final Report v1.0 of the DCPSC MEDSIS Stakeholder Working Groups

MAY 31, 2019

Prepared for:

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1 Executive Summary

The MEDSIS – Modernizing the Energy Delivery System for Increased Sustainability – working group process kicked off in August 2018, tasked with providing a set of recommended actions and next steps to the District of Columbia Public Service Commission (DCPSC). Six working groups were formed covering the following topics:

- Data and Information Access & Alignment
- Non-Wires Alternatives to Grid Investments
- Rate Design
- Customer Impact
- Microgrids
- Pilot Projects

Charters were developed by each working group to direct their activities. Included were the key questions each working group wanted to address and the outcomes they desired from the working group process.

Stakeholder Engagement and Collaboration

Industry, government, consulting, advocacy groups (ratepayer, environmental and consumer), Pepco, and other interested stakeholders participated in the MEDSIS stakeholder working group process. There was a high level of attendance throughout the entire process. On average, there were 132 attendees at the working group meetings every month (August – May).

The stakeholders worked together to share ideas and lessons learned, draft proposals for consideration, and frame the recommendations that are presented in this report. Together these stakeholders shared, created, and posted approximately 200 documents that were used to develop the recommendations. The groups also leveraged an 'Action Item' task list to ensure activities in each group progressed. Over the course of the working group process, stakeholders generated over 300 action items which were tracked and closed prior to submitting this final report.

As one might expect, many of the topics are interrelated. The MEDSIS Consultant worked to ensure various groups were aware of discussions regarding related topics that occurred in other working groups. In total, the working groups came up with 32 recommendations and 10 learnings for consideration by the DCPSC.

Chapter 4 of this report provides more details on the working group process including statistics on stakeholder participation, topics covered by each working group, and overall lessons learned from the process as documented by the MEDSIS Consultant.

Recommendations and Learnings

The major work product of the working group process is a set of recommendations and learnings for DCPSC consideration. Recommendations and learnings are classified as follows:

1. Recommendations – concepts, actions, programs, initiatives or projects that have been fully vetted by the working group. Recommendations were defined with specificity or with sufficient detail to be actionable by the DCPSC.
2. Learnings – concepts, actions, programs, initiatives, or projects discussed by the working group but for which there was not enough detailed information to make a recommendation.

The table below lists all the recommendations and learnings that were developed as well as the working groups in which they originated and were discussed. A full description of each recommendation or learning is provided in Chapter 5 of this report. Stakeholder comments and their positions of support or dissent are recorded in the same section.

MEDSIS Working Group Recommendations and Learnings							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
WG1 – Data and Information Access and Alignment							
5.1.1	DCPSC to Explore Metric for Evaluating Carbon Footprint Impact of DER Projects	x	x			x	x
5.1.2	DCPSC to Develop Benefit Cost Analysis (BCA) Methodology	x	x				
5.1.3	DCPSC to Align MEDSIS with Clean Energy DC Act	x	x	x	x	x	x
5.1.4	DCPSC to Continue to Improve Small Generator Interconnection Process	x	x		x	x	
5.1.5	DCPSC to Revise Language in MEDSIS Vision Statement	x					
5.1.6	DCPSC to Develop Publicly Available System-Level Data Webpage	x	x	x	x		
5.1.7	DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis	x	x				

MEDSIS Working Group Recommendations and Learnings							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.1.8	DCPSC to Direct Pepco to Create a Secure Web Portal for RFP Responses and Programmatic Data Requests	x	x		x		
5.1.9	Apply MEDSIS Guiding Principle Metrics for General DCPSC Decision Making	x	x	x	x	x	x
5.1.10	Learning: Balance System-Level Data Availability with Security and Affordability	x	x		x		
WG2 – Non-wires Alternatives to Grid Investments							
5.2.1	DCPSC to Establish an NWA Definition		x				
5.2.2	DCPSC to Establish NWA Classification		x				
5.2.3	DCPSC Should Order a Stakeholder-Informed DSP and NWA Consideration Process	x	x	x	x		
5.2.4	DCPSC to Establish an Advanced Inverter Definition		x				
5.2.5	Learning: Stakeholder Input on DCPSC Rules Around Ownership of DERs		x		x	x	
5.2.6	Learning: Need for Demonstrating NWA Projects in the District	x	x		x	x	x
5.2.7	DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment	x	x	x			x
WG3 – Rate Design							
5.3.1	DCPSC to Reconvene a Working Group to Develop a Specific Residential Dynamic Pricing Program			x			
5.3.2	DCPSC to Initiate a Value of DER and Value of Grid Study		x	x			

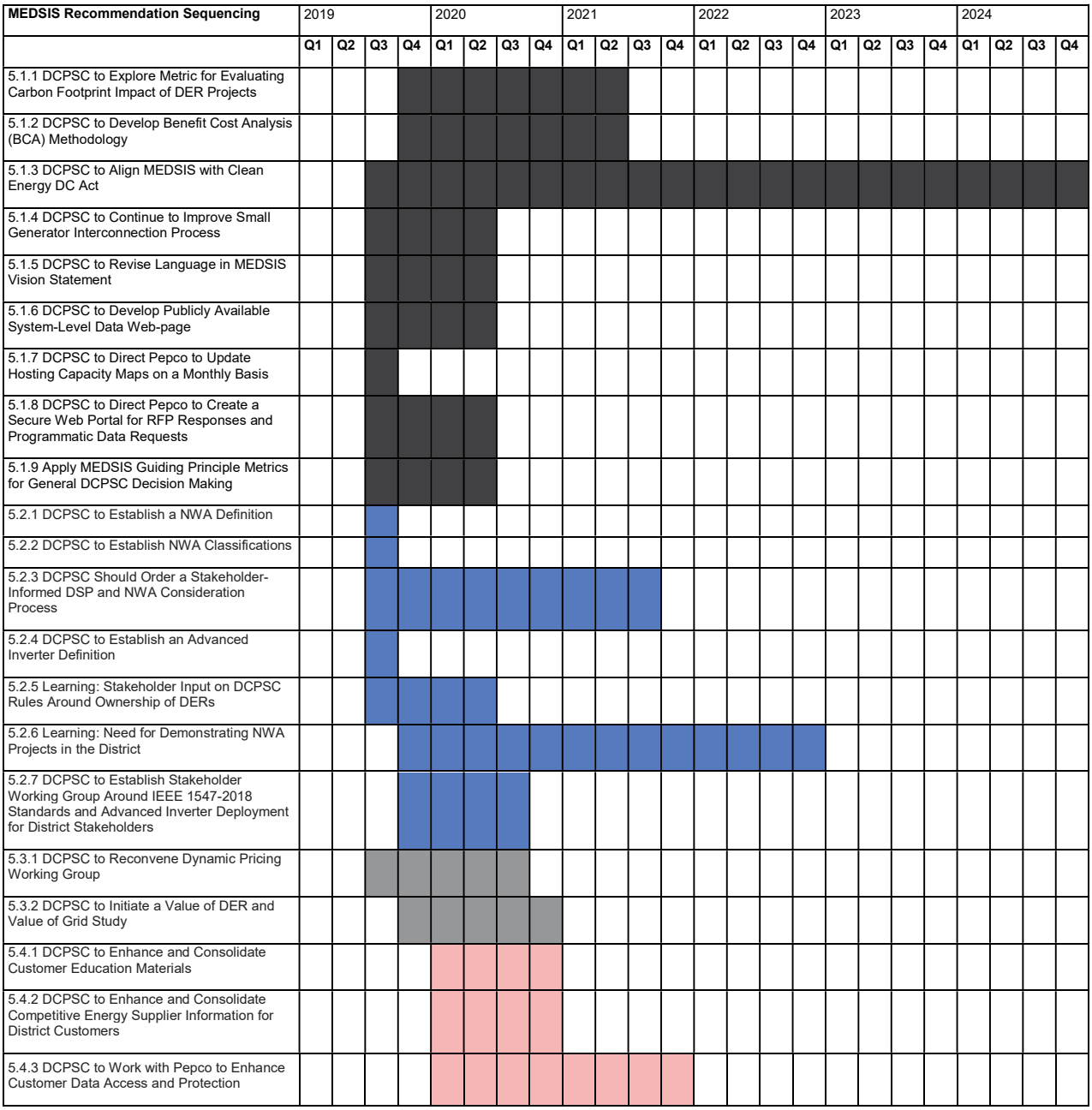
MEDSIS Working Group Recommendations and Learnings							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.3.3	Learning: Performance Based Regulation (PBR) in the District		x	x			
WG4 – Customer Impact							
5.4.1	DCPSC to Enhance and Consolidate Customer Education Materials				x	x	
5.4.2	DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers				x	x	
5.4.3	DCPSC to Work with Pepco to Enhance Customer Data Access and Protection	x			x	x	
5.4.4	DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments				x	x	
5.4.5	DCPSC to Enhance Customer Participation in Low-Income Programs	x			x		
5.4.6	DCPSC to Revise the CBOR to Support the MEDSIS Pilot Projects Phase				x	x	
5.4.7	Learning: Opportunity for Resilience Hubs in the District	x	x	x	x	x	x
5.4.8	DCPSC to Ensure Connection Between Customers' Energy Usage and their Environmental Impact			x	x		
WG5 – Microgrids							
5.5.1	Learning: List of Microgrid Assets and Classifications in the District					x	
5.5.2	Learning: Need for Establishing a Regulatory Framework in the District and Leveraging Existing DCPSC and D.C. Government Standards			x	x	x	
5.5.3	DCPSC to Establish New Regulated Entity of "Microgrid Operator"		x	x	x	x	

MEDSIS Working Group Recommendations and Learnings							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.5.4	DCPSC to Direct the Utility to Establish a Customer Microgrid Schedule		x	x	x	x	
5.5.5	DCPSC to Determine how Utilities Recover Costs of Microgrid Assets				x	x	
5.5.6	Learning: Opportunity to Define Resilience at the Distribution Level	x	x	x	x	x	
5.5.7	DCPSC to Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids	x			x	x	
5.5.8	DCPSC and D.C. to Modify Methodology for Calculating DCPSC and D.C. Law Surcharges on District Customers' Bills	x		x	x	x	
5.5.9	Learning: Need to Define a Customer Complaint Process for Assets that are Leased or Operated by Third-Party		x		x	x	
5.5.10	Learning: Opportunity to Leverage MEDSIS Funds to Pilot Multi-Customer Microgrids in the District					x	x
WG6 – Pilot Projects							
5.6.1	DCPSC to Implement Exclusion Criteria to Pilot Project Selection Process						x
5.6.2	DCPSC Should Implement a Pilot Project Selection Process with Two Step Screening						x
5.6.3	DCPSC to Adopt Grant Funding Qualification Parameters for Pilot Projects						x
5.6.4	DCPSC to Implement a Pilot Projects Governance Model						x

Table 1.1 MEDSIS Working Group Recommendations and Learnings

Recommendation Coordination and Sequencing

To inform the Commission regarding how the various recommendations and learnings are interrelated or dependent on one another, the working groups discussed the timing for implementing each recommendation and its alignment with the MEDSIS vision. By considering these two factors, a high-level plan for coordinating and sequencing the recommendations was developed.



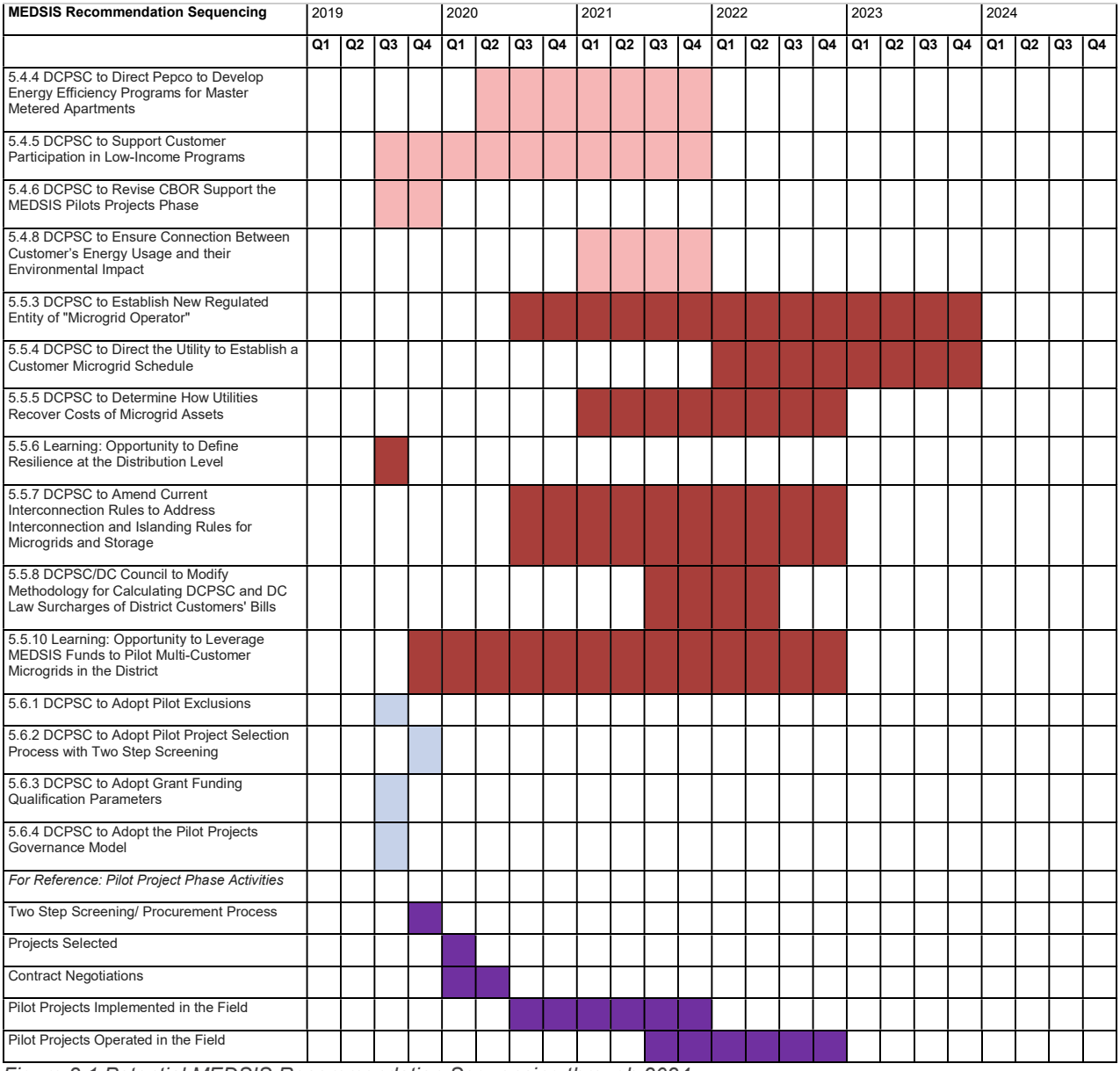


Figure 2.1 Potential MEDSIS Recommendation Sequencing through 2024

A full description of the methodology used to coordinate and sequence the recommendations is provided in Chapter 6 of this report along with summary level results for the coordination and sequencing plan. Detailed data developed for recommendation timing is provided in Appendix 10, as is detailed data on recommendation alignment to MEDSIS principles.

2 Introduction

This report summarizes the process, findings, and lessons learned from the MEDSIS working groups initiated under DCPSC Order 19432[1] in Formal Case 1130. This report combines findings from all six MEDSIS working groups and reflects the contributions of many individuals and organizations. These stakeholders worked together tirelessly and collaboratively to provide the DCPSC with a valuable set of recommendations and learnings intended to assist the District on its journey toward realizing the MEDSIS vision.

The report is organized as follows:

1. Executive Summary – a summary of the report intended for those readers who would like a high-level perspective of the report's contents.
2. Introduction – explains how the report is organized.
3. Background – a description of the events that lead to the development of the MEDSIS working groups.
4. Working Group Process and Summary – summary of the formation of the stakeholder working groups, establishment of the working group charters, topics discussed in each working group and statistics and demographics of the working group participants.
5. Recommendations and Learnings – key findings from the working group process that the DCPSC should consider to further realization of the MEDSIS Vision. Each recommendation includes a discussion of the working group process that contributed to the development of the recommendation, a description of the recommendation itself, and a compilation of the inputs and positions of the working group stakeholders who contributed to the recommendation.
6. Next Steps – recommendations on the timing, MEDSIS alignment and sequencing of the recommendations and learnings from Chapter 5.

Appendices supplement the main report and provide additional details that support the report's findings.

A.1 Meeting Matrix – a summary of all the meeting topics discussed by the working groups from August 2018 – May 2019.

A.2 List of Stakeholder Participants – a compilation of the companies that participated as stakeholders in any of the MEDSIS working groups.

A.3 List of Expert Speakers – industry or stakeholder subject matter experts from within the District and other jurisdictions who presented to the working groups.

[1] https://dcpsc.org/PSCDC/media/PDFFiles/HotTopics/OrderNo19432.pdf

A.4 Working Group Charters – a compilation of each working group's charter, which defines the key questions and desired outcomes of each working group.

A.5 Summary of Information from industry subject matter experts – summaries by working group of information learned from subject matter experts during each of the working group meetings.

A.6 Stakeholder proposals – a compilation of the proposals and strawmen submitted by stakeholders or the MEDSIS Consultants.

A.7 Documents Reviewed – a listing of the presentations, articles, white papers, and other documents made available to stakeholders during the working group process

A.8 Pilot Projects Screening and Scoring Template – the template recommended by the Pilot Projects working group to be used as a tool during the pilot project selection process.

A.9 Pilot Projects "Gap" Assessment – the output of an exercise the Pilot Projects working group conducted to evaluate DCPSC Staff's initial recommendations around pilot project grant funding parameters.

A.10 Recommendation Timing – the output of an activity conducted at the April Joint Working Group Meeting to assess whether recommendations would be implemented in the short-term, mid-term, or long-term.

A. 11 Recommendation Alignment with the MEDSIS Guiding Principles – the output of an activity conducted at the April Joint Working Group Meeting to assess how the recommendations aligned with the seven MEDSIS Guiding Principles.

Much appreciation goes to the many stakeholders who dedicated their time to participate in this process, for their ongoing commitment to making the District a leading city on energy policy and fulfilling the vision of MEDSIS.

3 MEDSIS Background

The DCPSC issued Order No. 17912 of Formal Case 1130 on June 12, 2015 that opened a proceeding to identify technologies and policies that can be implemented in the District of Columbia ("the District") to modernize the distribution energy delivery system for increased sustainability, now referred to as MEDSIS. The DCPSC held three technical workshops (October 1, 2015, November 19, 2015, and April 28, 2016) and received thoughtful input from a range of stakeholders outlining future energy delivery plans and visions along with suggestions for DCPSC action to help implement their visions.

Additionally, as a result of the PHI-Exelon Merger approved by the DCPSC 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. Based on these preliminary interactions and the comments filed in the Formal Case No.1130 docket, the DCPSC directed its Staff to synthesize these inputs to develop a Staff Report that provided a framework for considering the next steps to be taken by the DCPSC. The DCPSC Staff issued their report on January 25, 2017.

By Order No. 18717, the DCPSC granted the District of Columbia Government's ("District Government") motion to extend the initial and reply comment period to April 10, 2017 and May 10, 2017, respectively. On February 28, 2017, the DCPSC held a MEDSIS Town Hall Meeting to discuss the proposed pilot project parameters identified in the Staff Report.

By Order 19143 of Formal Case 1130 on October 19, 2017, the DCPSC invited the public to comment on the Staff's proposed vision statement for Modernizing the Energy Delivery System for Increased Sustainability (MEDSIS). By Order 19275 of Formal Case 1130 on February 14, 2018, the DCPSC adopted the MEDSIS Vision Statement as the official "Vision Statement for the MEDSIS Initiative." In Order No. 19275, the DCPSC also recognized that several stakeholders favored the use of a consultant to establish and manage working groups in the MEDSIS Initiative. The DCPSC issued a Request for Proposals to obtain a qualified consultant on March 1, 2018.

After engaging in a thorough competitive bidding process, the DCPSC awarded Contract No. PSC-18-08 for Phases 1 and 2 of the MEDSIS Initiative to the Smart Electric Power Alliance ("SEPA") on June 5, 2018.

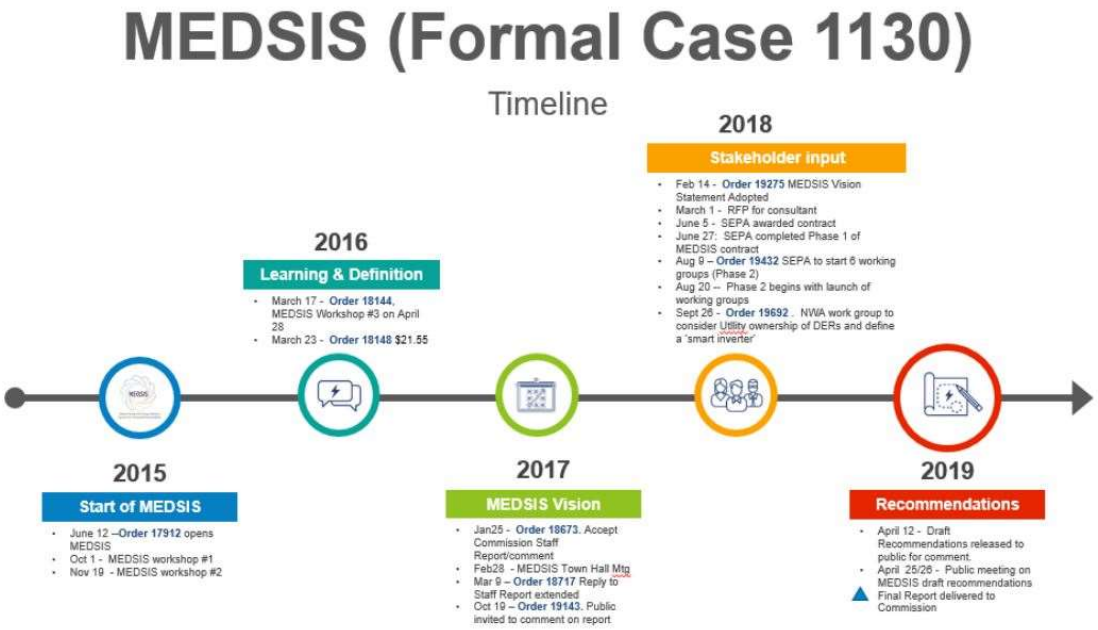


Figure 3. 1 – MEDSIS Timeline

By Order 19432 of Formal Case 1130 on August 9, 2018, DCPSC approved SEPA as "MEDSIS Consultant" to form the following working groups as part of the MEDSIS Initiative – (1) Data and Information Access and Alignment, (2) Non-wires Alternatives to Grid Investments, (3) Future Rate Design, (4) Customer Impact, (5) Microgrids, and (6) Pilot Projects. MEDSIS Consultant was directed to establish the working groups in accordance with the recommendations submitted; collaboratively develop charters, goals, and expected outcomes for each group taking into consideration the MEDSIS Vision Statement and the District Government's energy policy goals with stakeholders; and submit a final working group report, including recommended Commission actions and next steps, for each group within one (1) year from the date of the Order.

The attached report is the final report and recommendations from the open stakeholder meetings held from August 2018 to May 2019.

4 Working Group Process and Summary

The MEDSIS Working Group Process was carried out in two phases. Phase 1 involved the engagement of stakeholders through a technical conference[2] to determine the appropriateness of conducting a system assessment and develop the appropriate working groups to establish in Phase 2. Phase 1 was completed in July, 2018.

Phase 2, which is the subject of this report, involved the actual process of conducting the working groups and development of this working group report of recommendations. The working groups were formed as a result of DCPSC Order 19432 which established six working groups as follows:

Working Group 1: Data and Information Access and Alignment – The Data and Information Access and Alignment (DIAA) Working Group was responsible for covering the alignment of the MEDSIS vision statement with the Working Group process. The Working Group functioned as a forum to coordinate data and information in an accessible format with all the stakeholders between all Working Groups, including utility data and information related to relevant ongoing proceedings.

Working Group 2: Non-wires Alternatives (NWA) to Grid Investments – The Non-wires Alternatives (NWA) to Grid Investments Working Group addressed Pepco's interaction with specific technologies including, but not limited to, advanced control systems, energy storage, fuel cells, electric vehicles, photovoltaic systems, smart inverters, and voltage regulation equipment as well as the rules concerning Pepco's need to consider these technologies in the utility's distribution integrated resource planning process.

Working Group 3: Rate Design – The Rate Design Working Group investigated the impact of rate design on DER adoption, evaluated alternative rate designs, and addressed the basis for setting rates and proper cost causation and realization.

Working Group 4: Customer Impact Working Group – The Customer Impact Working Group addressed how increased DER integration impacts different customer types, particularly regarding customer equity, utility customer service, customer data privacy and low-income inclusion.

Working Group 5: Microgrids – The Microgrids Working Group addressed microgrid development in the District, including newly constructed microgrids and retrofitted microgrids. The group examined the benefits and costs of microgrids and produced recommendations to address microgrid ownership, operation, standards and implementation.

Working Group 6: Pilot Projects – The Pilot Projects Working Group was responsible for finalizing the parameters regarding pilot project governance and project selection, and

[2] July 27, 2018 Technical Conference Meeting Minutes: https://dcpsc.org/PSCDC/media/PDFFiles/HotTopics/FC1130-TechnicalConf-062718.pdf

management found in Section VII of the MEDSIS Staff Report. This group did not focus on producing actual pilot project concepts.

SEPA was retained by the DCPSC to facilitate the working group process. The primary scope was to establish the working groups, facilitate the working group meetings, and provide a working group report of recommendations to the DCPSC as indicated in Figure 4.1.

Figure 4. 1 – Working Group Approach

The working groups were open to anyone from the public that wished to participate. Stakeholders that had participated in the MEDSIS Technical Conference were recruited to participate along with other key District industry, governmental, public policy, and industry and consumer stakeholder groups. The relationships and interactions of the various District energy stakeholders is reflected in Figure 4.2 below. Demographics of the stakeholders that participated as MEDSIS stakeholders is provided in Section 4.1.

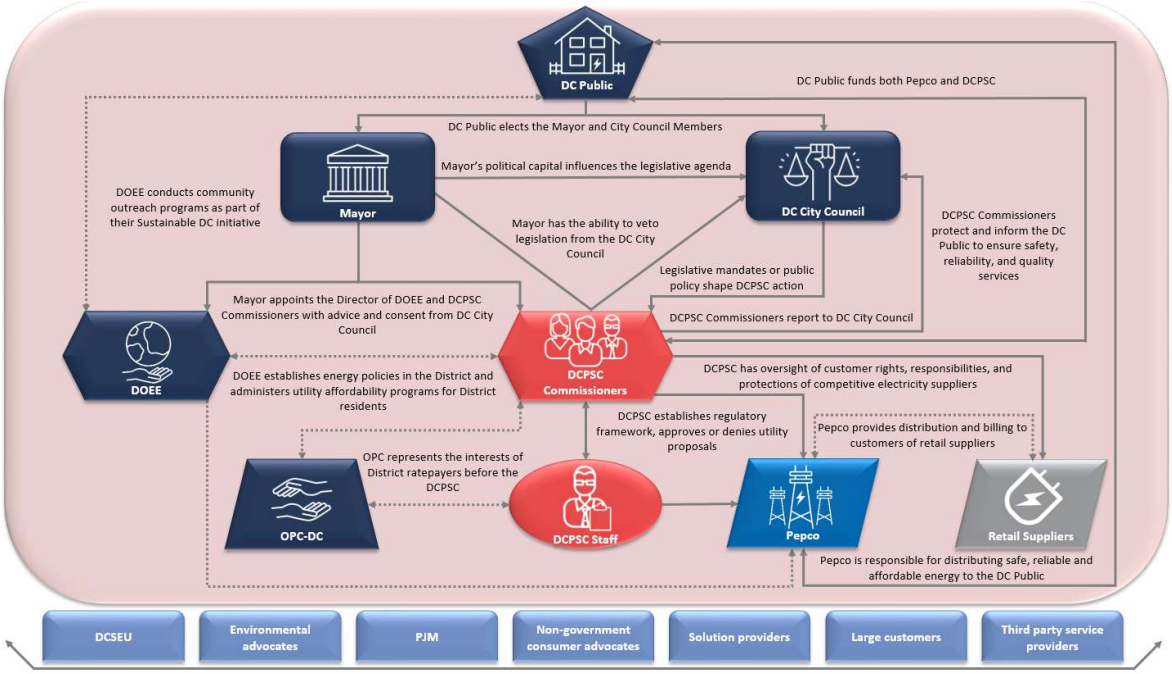


Figure 4. 2 – District Energy Stakeholder Landscape

A public facing website, www.dcgridmod.com, was created and deployed to facilitate the public's access to stakeholder activities and to facilitate the public's registrations to participate as working group members.

The working groups were formed in July 2018. The first meetings occurred in August 2018. From August 2018 to May 2019, the working groups met monthly with certain planned exceptions. Figure 4.3 below provides a high-level schedule of the working group meetings.

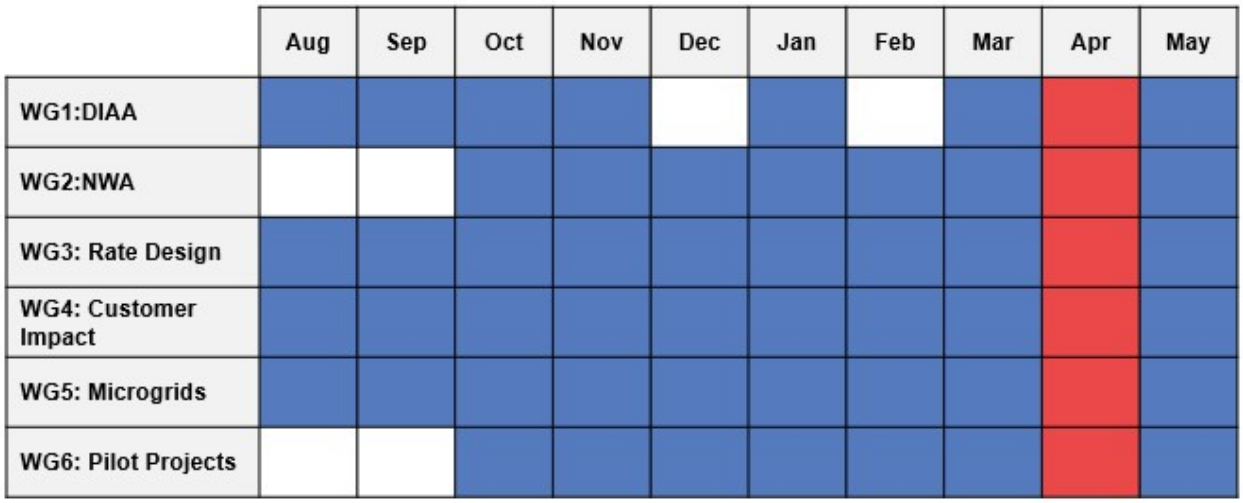


Figure 4. 3 – MEDSIS Working Group Meetings

(Note: In April there was an open two-day joint working group meeting held for working group members and the general public.)

Working group agendas specific to the objectives of each working group were created, but broadly speaking, they were developed to create a collaborative environment, then level set on the energy and regulatory landscape applicable to that working group. The end goal was to develop the recommendations contained in this report.

The first meeting focused on the development of working group charters that served as essential tools around which stakeholders coalesced to focus on the key questions and desired outcomes they wanted to address through the working group process. It also allowed each working group to clarify what was not in their scope.

The second component of creating a collaborative environment was exposing the stakeholders to the HigherLogic online collaboration tool deployed by SEPA to facilitate working group communications and document sharing.

Each working group then embarked on a series of meetings focused on increasing stakeholder awareness around key industry topics in an effort to level set each group. Guest subject matter experts, typically from other jurisdictions, were recruited to speak on specific topics. Meetings typically consisted of guest speaker presentations followed by a working group discussion to apply the information to the goals of MEDSIS and the unique characteristics of the District. In some cases, working group members presented their unique perspectives for the group's consideration. Topics covered by the working groups are discussed in more detail in Section 4.4 and a complete list of subject-matter experts and working group speakers is provided in Appendix A.3.

The last phase of the MEDSIS working group process entailed the development of recommendations. Recommendations were developed through several methods. First, when possible, recommendations or areas of common understanding were documented after meetings in the meeting minutes. In other cases, recommendations were derived from outcomes of exercises conducted during meetings or in surveys conducted

between meetings. After each meeting, key takeaways were documented in the meeting minutes. Many of these key takeaways helped inform the development of recommendations. Finally, stakeholders made proposals to the working groups that in some cases resulted in working group recommendations. A complete list of the proposals made by stakeholders is provided in Appendix A.6.

4.1 Stakeholder Demographics

The MEDSIS working groups were open to any member of the public who registered to participate at the D.C. grid modernization website. Other stakeholders who participated in the MEDSIS Technical Conference in June 2018 were recruited to participate but also had to register. This process resulted in a diverse group of individuals and company representatives from industry, government, consulting, advocacy groups (environmental and consumer), the utility, and other groups. In total, 242 individuals participated as stakeholders. Figure 4.4 below provides a breakdown of the company types these stakeholders represented.

Figure 4. 4 – MEDSIS Participant Breakdown

The complete list of working group participants is provided in Appendix A.2.

The MEDSIS working group process was open and transparent. Attendance for all of the working group meetings was documented in the meeting minutes. A large number of stakeholders registered for multiple working groups (see Figure 4.7). It was not uncommon to have more than one representative from an organization attend a working

group meeting. Table 4.1 below represents attendance to the MEDSIS working group meetings at an organizational level. The methodology for Table 4.1 is explained below.

Working Group 1 DIAA, Working Group 2 NWA, and Working Group 6 Pilot Projects each had seven working group meetings. Participation was represented as follows for these working groups:

- ○: Participated in none of the working group meetings
- ◔: Participated in 1 or 2 working group meetings
- ◐: Participated in 3 or 4 working group meetings
- ◕: Participated in 5 or 6 working group meetings
- ●: Participated in all 7 working group meetings

Working Group 3 Rate Design, Working Group 4 Customer Impact, and Working Group 5 Microgrids each had nine working group meetings. Participation was represented as follows:

- ○: Participated in none of the working group meetings
- ◔: Participated in 1 to 3 working group meetings
- ◐: Participated in 4 to 6 working group meetings
- ◕: Participated in 7 or 8 working group meetings
- ●: Participated in all 9 working group meetings

Organization	WG1	WG2	WG3	WG4	WG5	WG6
ABB	○	◔	○	○	◔	○
ACCES	○	○	○	◔	○	○
Advanced Energy Group	◔	◔	◔	○	◔	○
AECOM	○	◔	○	○	◐	◔
Apartment and Office Building Association of Metropolitan Washington (AOBA)	◐	●	◐	◕	◐	◕
Arcadia Power	○	◔	○	◕	○	○
Bicky Corman Law	○	○	◐	○	○	○
Bidgely	◔	◔	◔	◔	○	○
Brattle Group	○	○	◔	○	○	○

Organization	WG1	WG2	WG3	WG4	WG5	WG6
California Electric Commission	○	○	○	○	○	◔
Chargepoint	○	◔	○	○	○	○
Chesapeake Company on Energy	○	○	○	○	◔	○
ConEdison	○	◔	◔	○	○	○
ConnectDER	◔	○	◔	○	○	◔
DC Office of the Attorney General (OAG)	○	◔	○	○	◐	○
DC Office of the People's Counsel (OPC)	●	●	◕	●	◕	●
DC Water and Sewer Authority	○	○	◔	◔	○	○
DC Climate Action (DCCA)	◕	●	●	○	◐	○
DC Sustainable Energy Utility (DCSEU)	◕	◕	◐	◐	◕	●
DER Consulting	○	○	◔	○	○	○
District Solar	◔	◐	○	○	○	○
Department of Energy and Environment (DOEE)	●	●	●	◐	◕	◔
Duane Morris LLP	○	◔	◔	○	◐	○
E3	○	○	○	◔	○	○
Earthjustice	○	◕	◐	○	○	○
Edison Electric Institute (EEI)	◕	◕	◐	◐	●	◔
Elevate Energy	○	○	◔	○	○	○
Enbala	○	◐	○	○	○	○
Energy Forward	◔	○	○	○	◐	○
Energy Scalable	○	○	○	○	◔	○
Energy Solutions	○	○	○	○	◔	○

Organization	WG1	WG2	WG3	WG4	WG5	WG6
EPRI	○	○	○	○	◔	○
ESA	○	◔	○	○	◔	○
Exelon Utilities	◕	◕	◕	◕	◕	◐
Fluence	○	◔	○	○	○	○
General MicroGrids	○	◔	◐	◔	◕	◔
George Washington University	○	○	○	○	◔	○
Greentel Group	◔	○	○	○	○	○
Grid Alternatives	○	○	○	◐	○	○
Grid Lion	○	◔	○	○	○	○
GridUnity	◔	◔	○	○	○	○
Grid2.0	◐	●	◕	◕	◕	◐
GridWise Alliance	○	◔	◔	○	◔	○
Home Energy Analytics	○	○	○	◔	○	○
Honeywell	○	○	○	○	◔	○
ICF	◐	◔	○	○	◔	○
Innovation Energy Project Development	○	○	○	○	◔	○
Institute for Market Transformation	○	○	○	◔	○	○
Institute for Policy Integrity, NYU	○	○	◔	○	○	○
Landis+Gyr	○	○	○	◔	○	○
Metro DC DSA	○	◔	○	○	○	○
Microgrid Resource Coalition (MRC)	○	○	○	○	◐	○
Mission Data	○	○	○	◔	○	○
MKA Cyber	◔	○	○	○	○	○

Organization	WG1	WG2	WG3	WG4	WG5	WG6
Morgan, Lewis and Bockius LLP	○	◐	○	○	◔	○
National Energy Marketers Association	○	○	○	◔	○	○
Navigant Research	○	◐	○	◐	◔	○
NEST	○	○	○	◔	○	○
New Columbia Solar (NCS)	○	◕	○	○	○	○
New Regulation LLC	○	○	○	○	◔	○
New York Department of Public Services	○	○	○	◔	○	○
NV5	○	◔	○	○	◐	○
OPAL-RT Technologies Inc	○	○	○	○	◔	○
Opus One Solutions	◔	○	○	○	◔	○
PA Consulting Group	◔	◔	○	○	○	◔
Pareto Energy	○	◔	○	◔	◔	○
PEER Consultants	○	○	○	○	○	◔
Pepco	●	●	●	●	●	●
PJM Interconnection	◔	◔	◔	○	◐	○
Plugged In Strategies	◔	○	◔	○	○	○
QTech Rock	○	○	○	○	◔	○
Regulatory Assistance Project (RAP)	○	○	◔	○	○	○
Revilo Hill Associates	○	○	◔	◔	○	○
Rhode Island PUC	○	○	◔	○	○	○
Siemens	○	○	○	○	◔	○
Sierra Club	○	◔	◔	○	○	◔
DC Solar United Neighborhoods (DCSUN)	○	○	◔	○	○	○

Organization	WG1	WG2	WG3	WG4	WG5	WG6
Storke LLC	○	○	○	○	◔	○
Sunrun	◔	◕	◐	◔	○	◐
Tangent Energy	○	○	○	◔	○	○
Tenley Consulting	○	◔	○	○	○	○
Tesla	○	◔	○	○	○	○
The Climate Mobilization	○	◔	○	◔	○	○
Think Eco	○	◔	○	○	◔	◐
Tracey Warren	○	○	◕	○	○	○
Urban Ingenuity	○	◕	○	○	◕	○
US Department of Energy (DOE)	◔	○	○	○	○	○
US General Services Administration (GSA)	○	◔	○	○	◔	◔
USGBC	◔	○	○	○	◔	◔
VEIC	◔	○	◐	○	◐	○
Washington Gas	○	○	◔	○	◔	○
Wedgemere Group	◔	◔	○	○	◔	◔
WGL Energy	◐	◕	◔	◕	◕	○
Wildan Energy Solutions	○	○	○	○	◔	○
Washington Metropolitan Area Transit Authority (WMATA)	○	◐	○	◔	◔	◔

Table 4. 1 – MEDSIS Working Group Meeting Attendance

4.2 Working Group Charters

Each working group developed charters to provide direction to the working group, confirm the working group scope, and most importantly, identify the key questions and desired outcomes for the working group. Charters also addressed the roles and responsibilities of the working group members and any deliverables anticipated.

Provided below are the "Purpose, Key Questions, and Desired Outcomes" sections for all six MEDSIS working groups as originally developed by the working groups in their August 2018 meeting and as updated, if applicable, during the working group process. Full charters for all working groups are provided in Appendix A.4.

While the working group did in some cases update the charters from their original August 2018 version, the charters were not updated to reflect changes in focus by the working group. Some working groups may have addressed all the key questions and desired outcomes while other working groups may have only partially addressed them.

WG1: DATA INFORMATION ACCESS AND ALIGNMENT

Working Group Purpose:

The Data and Information Access and Alignment (DIAA) Working Group will address measurable objectives of the MEDSIS Vision Statement with the Working Group process to develop an informed process for the Commission to make regulatory decisions. The Group will utilize the U.S. Department of Energy Grid Modernization Strategy roadmap to inform the overall MEDSIS Working Group process. This framework and roadmap will be the connective tissue that keeps the various MEDSIS Working Groups aligned and working toward a common goal. As part of the final deliverable, the Group will develop a coordination plan outlining the sequence and timing of policy recommendations coming out of each MEDSIS Working Group. The Group will also track and monitor interrelated cases and other sustainability initiatives in the District and how they relate to the MEDSIS Working Group process.

The Group will also function to coordinate data and information accessibility in the MEDSIS Working Group process. Under this function, the Group will identify, at a high level, system level data needs for distributed energy resources (DER) integration purposes and coordinate data and information between each of the MEDSIS Working Groups.

Key Questions to Address:

Grid Modernization Strategy and Common Framework

1. What are the guiding principles and measurable objectives for developing a common framework for a modernized energy delivery system with increased sustainability in the District?
2. How does the grid modernization strategy and common framework support the development of pilot projects?
3. How should the policy recommendations coming out of each MEDSIS Working Group be prioritized and sequenced?
4. How does the grid modernization strategy and common framework relate to ongoing cases before the Commission and can this inform future Commission decision making?

Data and Information Availability and Accessibility

1. What types of data (and at what level of granularity) must be provided to stakeholders to achieve the MEDSIS vision? Who will have access to each type?
2. What delivery system data is available and how can it be packaged for stakeholders to utilize to further the MEDSIS vision?
3. What customer data is available and how can it be packaged, anonymized and/or aggregated to utilize in order to further the MEDSIS vision?
4. How will customer protection, privacy and security be ensured? (i.e. critical infrastructure and/or personally identifiable information)
5. What additional system level data is needed that isn't already available? For what purpose? At what cost?

Desired Outcomes:

Grid Modernization Strategy and Common Framework

1. Identify the guiding principles and measurable objectives for charting out a common framework for a modernized energy delivery system in the District.
2. Coordinate grid modernization strategy and framework with all MEDSIS Working Groups.
3. Align strategy and framework with existing environmental, energy and climate change policy in the District.
4. Track ongoing cases before the Commission and provide recommendations to inform future Commission decision making.

Data and Information Availability and Accessibility

1. Identify the types of delivery system and customer data that must be provided to stakeholders to evolve the energy delivery system of the future.
2. Package and catalog delivery system and customer data to the stakeholder to further the MEDSIS vision.
3. Inform all MEDSIS Working Groups on data accessibility and availability progress of this Group.
4. Identify additional system level data needed by each stakeholder to increase DER integration, outlining the purpose of obtaining the data as well as the cost and security implications.

WG2: NON-WIRES ALTERNATIVES

Working Group Purpose:

The Non-wires Alternatives (NWA) to Grid Investments Working Group will start with defining the purpose and goals around NWAs in the District. The Group will address and make recommendations on the process, tools, and information requirements needed to evaluate non-wires alternatives to conventional grid infrastructure

investments for meeting system needs. An objective of this group includes identifying when, where, and how – in the distribution system planning process – the utility and third-party providers can propose NWAs and the risks and compensations for NWAs.

The Group will consider utility access to and interaction with distributed energy resources (DERs) as defined by the Commission, including advanced inverters and regulation control equipment. The Group will specifically address utility ownership of DERs. The Group will help ensure that grid upgrades fully consider DERs for meeting system constraints prior to any grid infrastructure plans.

Key Questions to Address:

1. What are the goals of NWAs in the District?
2. What are the consistent and verified processes, tools and information requirements for planning non-wires alternatives to grid investments in the District?
    - What enhancements to the current utility distribution system planning processes (DSP), tools and information requirements could be adopted to achieve the MEDSIS vision?
    - Where and how in the distribution planning process can Pepco list opportunities for third parties to suggest and/or propose NWAs?
    - What supplemental information not currently provided is needed to enhance the utility distribution planning process for all participants?
3. What other jurisdictions can the Commission learn from while addressing NWAs and what case studies and lessons learned can be adopted in the District?
4. Per the 1999 Act introducing competition to the retail sale of electricity in the District, Pepco is not allowed to own generation facilities in the District for the purpose of selling electricity. What should the rules around generation sourced from DERs be in the District? Topics to address:
    - Ownership
    - Operation
    - Control
    - Value and Costs
    - Consumer Protection
    - Reliability
    - Cybersecurity
    - Data access by all parties

5. Can battery storage installed to improve the economics of EV charging infrastructure also provide grid and/or locational benefits in the District?
6. What are the existing methodologies and frameworks that best assign and evaluate the benefits and costs of DERs for NWAs?
7. What is the definition of an "advanced inverter"?
8. What happens to risk in an NWA world?
    - How is risk defined in NWA?
    - Who bears the risk for NWA projects? How do you assign risk or compensate the bearer of increased risk without passing it on to consumers?
9. What are the revenue models and utility incentives to promote NWAs?
    - What are the allowable earning structures for third-party and utility NWA contracts?
10. What types of NWA pilot projects should the working group recommend for the Commission's consideration?
    - What would be the purpose and desired outcomes/outputs of these NWA pilot projects?
    - What type of process is needed to shape the design and implementation of such pilots in order to gain the benefit of expert stakeholder inputs and to maximize lessons learned?

Desired Outcomes:

1. Develop a definition of NWA.
2. Identify the goals of NWAs in the District.
3. Review and provide input to the types of distribution system planning processes, tools and information requirements for Pepco to adopt.
4. Articulate opportunities and make recommendations to the Commission regarding Pepco's distribution system planning process for collaboration to promote NWA consideration.
5. Study NWA models and best practices from other jurisdiction that are compatible with the District.
6. Identify the existing benefit cost analysis (BCA) frameworks for NWA and develop recommendations for shared, consistent methodologies for assigning benefits and costs of NWA.

7. Develop recommendations for the Commission to consider addressing utility ownership of DERs, including but not limited to energy storage devices.
8. Develop recommendations on how to define, obtain information about and deal with risk in an NWA environment.
9. Identify the revenue models and utility incentives that can be developed to promote NWAs in the District.
10. Develop for the Commission's consideration a list of recommended NWA pilot projects.

WG3: RATE DESIGN

Working Group Purpose:

The Rate Design Working Group will discuss rate structures and alternative rate designs and regulatory models to enable and support the advancement of the MEDSIS vision while maintaining just and reasonable rates. The Group will:

- Investigate alternative rate design and regulatory models for the purpose of achieving the MEDSIS vision.
- Evaluate alternative rate designs and regulatory models with respect to, among other things, fundamental principles of ratemaking (e.g., cost causation, rate gradualism, etc.) as well as their effect on DER adoption.

Key Questions to Address:

1. What alternative rate designs can be used to achieve the MEDSIS vision?
    - What are the pros and cons of each?
    - What incremental steps can be taken to progress towards the vision?
    - Should rate structures and designs differ among rate classes?
2. How can alternative rate designs and regulatory models align the utility's business model with the MEDSIS vision while allowing the utility to maintain financial health and also promote cost savings?
    - How can cost savings for customers be aligned with utility earnings (win-win)?
    - What mechanisms would work best in the District?
    - How can rates drive utility behavior and MEDSIS objectives?
3. How can existing programs, incentives, and tariffs be coordinated to maximize the locational benefits and minimize the costs of DERs? What role does rate structure & regulation have in maximizing benefits and minimizing costs?

Desired Outcomes:

1. Alternative regulation and rate designs identified that advance the MEDSIS vision.
    - Safe, reliable and affordable electricity for all
    - Cleaner electricity
    - Integrating and connecting economically efficient DERs and devices
    - System utilization optimization
    - Rate Design contribution to the MEDSIS road map for DER integration and a sustainable energy delivery system.

WG4: CUSTOMER IMPACT

Working Group Purpose:

The Customer Impact Working Group will address how grid modernization efforts impact various customers. Topics will include: customer equity, utility customer service, customer data protection and privacy, adequate customer protections, and low- and limited-income customer inclusion. The Customer Impact Working Group will produce regulatory recommendations aimed at ensuring that all customers benefit from the Commission's energy distribution system modernization effort.

Key Questions to Address:

1. How can the MEDSIS vision be achieved at a reasonable cost in an equitable fashion across all customer classes and end users?
2. What information or tools are needed to enable all consumers to make smart energy choices and lower their costs?
3. How can MEDSIS enable more services to customers and allow customers and end users to create and derive value from the grid?
4. How can DERs result in value across all customer classes, including low and limited income customers?
5. How will customer and system data protection and privacy be ensured while consistent with the MEDSIS vision?
    - Who will have access to customer data?
    - What enforcement mechanisms exist or need to be developed to ensure data is properly protected?
6. How are low and limited-income customers defined and are there other sensitive customer groups that need to be considered?

Desired Outcomes:

1. Principles for achieving the MEDSIS vision at a reasonable cost and in an equitable fashion across all customer classes.
2. A framework and criteria for evaluating costs and benefits to customers of implementing the MEDSIS vision.
3. Recommended revisions to the Consumer Bill of Rights or other Commission regulations to advance the MEDSIS vision while maintaining customer protections.
4. Identified methods to ensure customer engagement and availability of data across all customer groups.
    - Recommendations on how to ensure protection of sensitive data while still advancing the MEDSIS vision.

WG5: MICROGRIDS

Working Group Purpose:

The Microgrid Working Group will address microgrid development in the District, including newly constructed microgrids and retrofitted microgrids. This group will examine the benefits of costs of microgrids, including factors such as safety, reliability and resiliency. The Microgrid Working Group will produce recommendations to address key questions raised in Section V.C. of the MEDSIS Staff Report regarding microgrid ownership, operation, standards, and implementation. In particular, this group will investigate if current regulations are adequate and appropriate to regulate the construction, operation, and maintenance of new and existing microgrid facilities.

Key Questions to Address:

1. How are costs for microgrid projects recovered? What are the different business and institutional models that need to be put in place to address proper microgrid compensation and cost recovery?
2. What types of entities should be allowed to own and operate microgrids?
    - What are the different types of ways utilities are able to engage in microgrid projects in the District?
3. What are the allowable microgrid ownership and operational structures under the Commission's current regulations?
4. How can the Commission improve on its current regulations to ensure that future microgrid projects achieve the MEDSIS vision?
    - Should a light touch regulatory framework be considered?
5. How can microgrids further enable customer choice in the District?

Desired Outcomes:

1. A taxonomy that classifies the different types of microgrid applications and business use-cases.
2. A recommended plan to identify existing and proposed microgrid projects in the District.
3. Determination on the adequacy of the Commission's current microgrid regulations to meet the MEDSIS vision and make recommendations for improvements, as needed.
    - Policy and regulatory recommendations should address allowable microgrid ownership and operation structures in the District.
4. Recommendations on how services or impacts related to microgrid functionalities can be compensated.

WG6: PILOT PROJECTS

Working Group Purpose:

In the MEDSIS Staff Report released in 2017, the Commission's Staff proposed an initial framework and parameters to be used to evaluate pilot project proposals. The Pilot Projects Working Group will make recommendations on the final framework and parameters regarding pilot project governance, selection, and management. The Pilot Project Working Group will not produce actual pilot project concepts or proposals. In particular, the group will address how pilot projects will be selected, monitored, and evaluated for success.

Key Questions to Address:

1. What is the governance model for MEDSIS Pilot Projects?
    - Who are the stakeholders and what are their roles?
    - What is the process for pilot selection, ongoing monitoring and post pilot evaluation of results?
    - What are the reporting requirements throughout?
2. What should the selection criteria (e.g., cost recovery, cost-effectiveness, EM&V criteria, additional funding, etc.) be for proposed MEDSIS pilot projects?
3. How should proposed MEDSIS pilot projects be screened to ensure they can be reasonably executed (i.e. qualifications, project experience, resume, etc.)?
4. What is the method for monitoring on-going MEDSIS pilot projects to ensure full transparency between all stakeholders?
5. What is the method for evaluating the outcome of MEDSIS pilot projects?

6. Should pilot projects be selected, monitored, and evaluated differently depending on the type and/ or duration of the pilot project (e.g., rate design pilot vs. a microgrid project, scalability, replicability)?

Desired Outcomes:

1. Recommendations on the governance model for MEDSIS pilot project selection, ongoing monitoring and post pilot evaluation of outcomes.
2. Recommendations for a standardized request for proposal (RFP) and pilot project scoring methodology.
    1. What qualifies, who qualifies, etc.?
    2. Should there be specific exclusion criteria? (i.e. DCPSC has stated in the Staff Report that unproven technologies, energy efficiency (EE) technologies and project led by unregulated subsidiaries of utilities should be excluded in MEDSIS pilot projects)
3. Recommendations for monitoring and reporting on-going MEDSIS pilot projects.
4. Recommendations for evaluating MEDSIS pilot project outcomes.

4.3 Working Group Statistics

Statistics on stakeholders and activities conducted by the working group from August 2018 to May 2019 are provided below.

Figure 4. 5 – Registered Participants by Working Group

Figure 4.5 shows the number of registrants per working group. The Non-wires Alternatives working group had the highest number of registrants at 126, with 33 average attendees per meeting. The Microgrids working group had 101 registrants and 27 average attendees per meeting. The Pilot Projects and Future Rate Design working group both had 95 registrants, though Rate Design meetings averaged 11 more attendees (24) than the Pilot Projects working group (13). The Data Information Access and Alignment and Customer Impact working group had 73 and 79 registrants respectively and averaged 16 and 18 attendees per meeting.

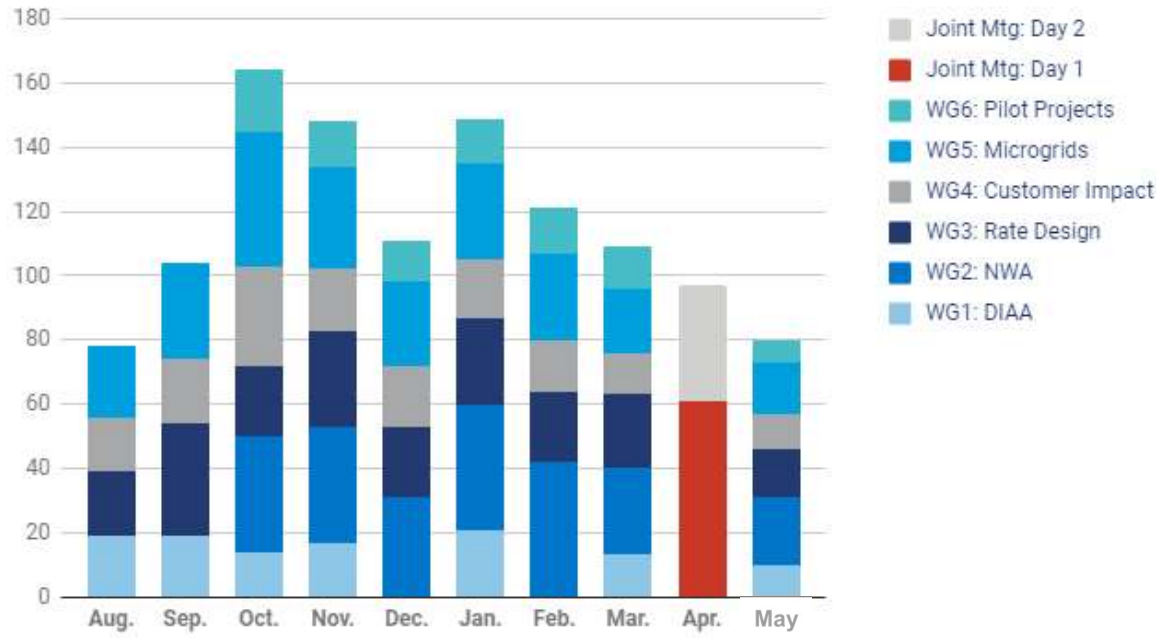


Figure 4. 6 – Working Group Attendees per Month

(Note: The meetings for WG2: Non-wires Alternatives and WG6: Pilot Projects were first held in October. This was an intentional staggered approach since information from other groups would inform these two groups.)

(Note: WG1: Data Information Access and Alignment did not meet by design in December or February.)

(Note: In April, there was a two-day Joint Working Group Meeting that was also open to the public.)

Figure 4.6 depicts the number of working group attendees per month. These totals include in-person and online attendees and exclude facilitators and other consultant staff. October was the highest attended month of meetings with 164 total attendees followed by November and January with 148 and 149 attendees respectively. On average, there were 132 attendees to the working group meetings each month.

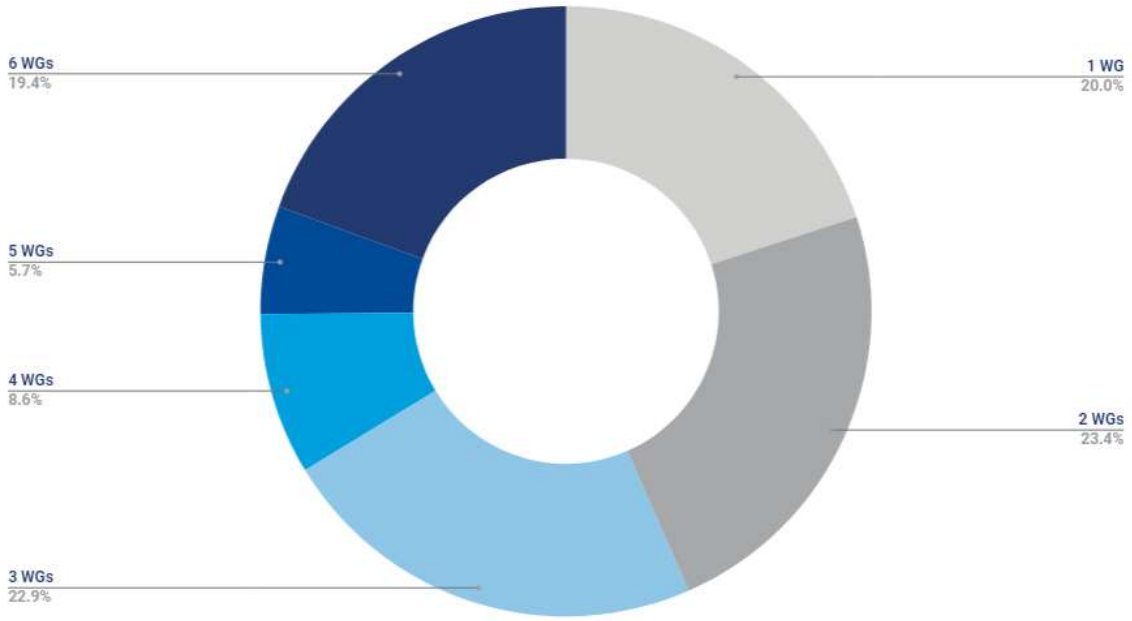


Figure 4. 7 – Working Group Registrations per Stakeholder

Figure 4.7 depicts the number of working group registrations per stakeholder. The majority of stakeholders (56.6%) participating in the MEDSIS working group process signed up for multiple working groups. Additionally, almost the same number of stakeholders registered for all six working groups (19.4%) as stakeholders who registered for just one working group (20%). The most common registration was for two working groups (23.4%).

Working Group	Mtg Month	Ation Item	Priority	Month Due?	Status
WG4: Customer Impact	January	Remove reference to "System data" in Customer Impact Charter Key Questions. System data is addressed by DIAA Working Group	Tier 2	February	Complete
WG4: Customer Impact	January	Get MD PSC and BGE perspective on reasoning behind their implementation of a prepay program in MD	Tier 2	February	Complete
WG4: Customer Impact	January	Review Customer Data Access and Protection impacts on Key Questions as documented in the meeting on the slides. Consultant will send a consolidated view of this out for team review	Tier 1	February	Complete
WG5: Microgrids	December	DCPSC look into what entities are required to report fuel mix and emission standards?	Tier 2	January	Complete
WG5: Microgrids	January	Working group to finish the Hybrid model (Safety & Performance standards) and draft the Public-purpose model for the February meeting (focusing on how it changes from the Hybrid model)	Tier 1	February	Complete
WG6: Pilot Projects	January	Consultant to develop a strawman evaluation criteria form for the group to evaluate	Tier 1	February	Complete
WG6: Pilot Projects	January	Consultant to develop a strawman pilot project selection timeline & process (with two phase screening and renaming convention)	Tier 1	February	Complete
WG6: Pilot Projects	January	Consultant to socialize the idea of screening process where applicants' TRL and alignment with the MEDSIS vision statement and guiding principles are evaluated and potentially scored	Tier 1	February	Complete
WG6: Pilot Projects	February	Facilitator to reword the MEDSIS Principle measurable objectives as questions to better serve as Pilot Project Screening Criteria	Tier 1	March	Complete
WG6: Pilot Projects	February	Facilitator to send out meeting minutes from where projects being led by unregulated subsidiaries of utilities was discussed in a previous meeting (Mtg 2)	Tier 2	March	Complete
WG6: Pilot Projects	February	Facilitator to revise the Scoring Criteria Strawman and redistribute for stakeholder review and comment	Tier 1	March	Complete
WG6: Pilot Projects	February	Facilitator to develop a strawman for the pilot process governance structure and distribute it for stakeholder review and comment	Tier 1	March	Complete
WG6: Pilot Projects	February	Facilitator to look into making the MEDSIS principle criteria quantitative (i.e. 20 points per question, perfect score is 100, needs to meet a minimum of 80)	Tier 1	March	Complete
WG6: Pilot Projects	February	Working group members to review the Pilot Project Evaluation Strawman and provide comment	Tier 1	March	Complete
WG6: Pilot Projects	February	Working group members to review and answer the questions regarding the Level 1 and Level 2 screening process	Tier 1	March	Complete
WG4: Customer Impact	February	Facilitator to send out the strawman pilot recommendation for DOEE's Resilience Hubs to the group for comment and send the comments to DOEE	Tier 1	March	Complete
WG4: Customer Impact	February	DOEE to take stakeholder comments on the strawman pilot recommendation and present a pilot proposal for Resilience Hubs at the March working group meeting	Tier 1	March	Complete
WG4: Customer Impact	February	Facilitator to send out link to DOEE report on their community engagement effort	Tier 1	March	Complete
WG4: Customer Impact	February	OPC to refine the "recommendations" from their October presentation into actionable recommendations for the Commission to consider and stakeholders to comment on at the March working group meeting	Tier 1	March	Complete
WG3: FRD	February	Facilitator will draft a consensus recommendation based on the working group discussion of Pepco Recommendation to MEDSIS Rate Design Working Group: A Path Forward to Dynamic Pricing for working group review	Tier 1	March	Complete
WG3: FRD	February	DC Climate Action will develop a presentation for the next meeting including a brief outline of a District large customer SOS default TOU rate structure	Tier 1	March	Complete

Figure 4. 8 – MEDSIS Action Item Tracker

Figure 4.8 displays a snapshot of the "action list" document used to track working group execution of action items. Working group activities between August and May resulted in 301 action items and follow up activities. Of the 301 action items, 135 were classified as "Tier 1" action items or those that need to be completed in order for the working group to progress and stay on track. There were 99 "Tier 2" action items that were important to complete but deemed not to have a direct impact on working group progression. Finally, there were 67 "Tier 3" action items that were process and administrative oriented and tended to occur on a regular basis. At the time of submittal of this report, all 301 action items have been completed and closed.

4.4 Topics Discussed

Agendas for the working group were put together by the MEDSIS Consultant with input from the stakeholders. In the early meetings, the MEDSIS Consultant set the agendas based on the key questions and desired outcomes documented in the working group charters. Stakeholders where encouraged to bring forth ideas and recommend subject matter experts that the group could benefit from listening to. Subject matter experts, if needed, were scheduled to educate the working group on the planned agenda topic(s). The last agenda item for these early meetings was an open discussion on topics the working group would like to discuss in the next meeting. No active dockets were discussed in the meetings. The need for greater visibility into the topics to be discussed or requiring additional discussion eventually became clear and the MEDSIS Consultant was able to forecast the agenda for remaining meetings. The MEDSIS Consultant decided to combine the future meeting agendas into one document to provide both forward visibility for each working group, as well as awareness of the topics other working groups were covering. These future meeting matrices were included in every meeting's monthly presentation materials and can be found in Appendix A.1 of this document.

The meetings matrix evolved with time and was adjusted as needed based on working group progress and interests. Each working group topic is organized by month in the future meetings matrix found in Appendix A.1. In some cases, additional topics may have also been covered. Likewise, in some cases planned topics may have been deferred and revisited in a subsequent meeting. In addition, all meeting agendas, recordings, emails, and materials for all working groups are resident in the HigherLogic platform. The public could access this information by first registering for the working groups at the dcgridmod.com website. After selecting the working groups, an email was sent explaining how to gain access to the HigherLogic Platform where all materials reside.

WG1: DATA INFORMATION ACCESS AND ALIGNMENT (DIAA)

August: In August the DIAA working group refined the DIAA working group description, determined the working groups desired outcomes, identified key questions for the working group to address, and drafted the working group's charter.

September: In September, the DIAA working group reviewed existing grid modernization efforts and frameworks; developed and ranked goals, principles, milestones and metrics of the MEDSIS roadmap; heard from the U.S. Department of Energy (DOE) on grid modernization strategies and planning processes; and began assigning measurable objectives to the MEDSIS Guiding Principles.

October: In October, the DIAA working group reviewed and refined the measurable objectives assigned to the MEDSIS Guiding Principles and developed the DOE Grid Modernization Chevron Map for MEDSIS. For more details on the DOE Grid Modernization Chevron Map for MEDSIS, refer to the "WG1: Data Information Access Alignment" portion of Appendix A.5.

November: In November, the DIAA working group finalized the assignment of measurable objectives to the first three MEDSIS Guiding Principles (Well-Planned, Safe & Reliable, and Secure), reviewed and drafted measurable objectives for the remaining MEDSIS Guiding Principles (Affordable, Sustainable, Interactive, and Non-discriminatory), and finalized survey questions for stakeholder system-level data needs.

January: In January, the DIAA working group reviewed the current state of system-level data availability in the District; reviewed the results from the DIAA System-Level Data Survey; heard different perspectives on system-level data planning from Greentel Group, GridUnity, and MKACyber; and discussed system-level data sharing, gaps, and recommendations.

March: In March, the DIAA working group reviewed the Draft Recommendations Document, heard from Pepco on system-level data availability and justifications for access, and reviewed and accepted three new recommendations around system-level data access.

April: In April, working group members and the public participated in a Joint Working Group Meeting where all six working groups came together for two, all-day meetings. During these two days, working group members reviewed the recommendations from all six working groups and identified recommendations and learnings to be consolidated and to be repositioned as recommendations and learnings. Additionally, working group members identified the timing for each recommendation and evaluated the recommendations' alignment with the MEDSIS Guiding Principles.

May: In May, the DIAA working group reviewed results from the recommendation timing and principle alignment activities conducted at the April Joint Working Group Meeting and discussed recommendation dependencies and sequencing.

WG2: NON-WIRES ALTERNATIVES TO GRID INVESTMENTS

October: In October, the Non-wires Alternatives working group refined their working group description, determined the working group's desired outcomes, identified key questions for the working group to address, and drafted the working group's charter.

November: In November, the Non-wires Alternatives working group developed a definition for NWA, identified types of NWAs, and identified purposes and goals of NWAs in the District.

December: In December, the Non-wires Alternatives working group reviewed and finalized the MEDSIS NWA terminology including NWA definition, classifications, technologies, and benefits. In this meeting, working members also reviewed NWA case studies, learned about distribution planning in other jurisdictions from SEPA and Con Edison, and identified drivers for enhanced distribution planning in the District as well as gaps in the process.

January: In January, the Non-wires Alternatives working group reviewed the distribution system planning framework, learned from Avangrid on integrating NWAs into the planning process, heard Pepco's proposal for a stakeholder-informed distribution system planning (DSP) and NWA consideration process, and discussed recommendations for the planning process in the District.

February: In February, the Non-wires Alternatives working group heard insights from the Energy Storage Association on storage ownership principles, listened to presentations from Tesla and Fluence on energy storage ownership and business models, discussed stakeholders' positions around ownership of DERs, and reviewed v2.0 of Pepco's DSP/NWA process proposal.

March: In March, the Non-wires Alternatives working group reviewed stakeholders' advanced inverter and pilot recommendation proposals, discussed DER ownership recommendations, and confirmed the schedule for remaining working group meetings.

April: In April, working group members and the public participated in a Joint Working Group Meeting where all six working groups came together for two, all-day meetings. During these two days, working group members reviewed the recommendations from all

six working groups and identified recommendations and learnings to be consolidated and to be repositioned as recommendations and learnings. Additionally, working group members identified the timing for each recommendation and evaluated the recommendations' alignment with the MEDSIS Guiding Principles.

May: In May, the Non-wires Alternatives working group reviewed results from the recommendation timing and principle alignment activities conducted at the April Joint Working Group Meeting and discussed recommendation dependencies and sequencing.

WG3: RATE DESIGN

August: In August, the Rate Design working group refined their working group description, determined the working group's desired outcomes, identified key questions for the working group to address, and drafted the working group's charter.

September: In September, the Rate Design working group heard from Brattle Group on alternative rate design, learned about performance based regulation (PBR) and activities in other jurisdictions, prioritized interest in understanding particular rate designs in greater depth, and identified topics for future meetings.

October: In October, the Rate Design working group learned more about PBR from the Regulatory Assistance Project (RAP) and discussed how it could be applied in the District. Also in this meeting, Pepco presented on the current rate structure in D.C. and working group members discussed alternative rate designs to investigate in future meetings.

November: In November, the Rate Design working group learned how other utilities implemented elements of PBR from Con Edison and the Rhode Island Public Utilities Commission and discussed their applicability to D.C. During this meeting working group members also identified performance improvement metrics (PIMs) that could potentially be applied in the District.

December: In December, the Rate Design working group finalized discussion around PBR and how it addressed key questions listed in the Rate Design working group charter, heard from Pepco on existing performance metrics and penalties in the District, and identified PIMs that may apply in the District.

January: In January, the Rate Design working group heard from Elevate Energy on Illinois' hourly pricing programs and history on hourly rate programs; listened to Pepco's

experience with innovative rate design in D.C., Maryland, and Delaware; and discussed additional alternative rate design case studies and best practices for pilot projects around rate design. During this meeting, working group members also continued to work on the PIM mapping exercise initiated in prior meetings.

February: In February, the Rate Design working group completed the PIM mapping exercise and reviewed alternative rate design proposals from PEPCO and DC Climate Action (DCCA).

March: In March, the Rate Design working group finalized the PIM mapping activity, reviewed and discussed recommendations from the D.C. Department of Energy and the Environment (DOEE) and DCCA, reviewed the initial Draft Recommendations Document, and confirmed the schedule for the remaining working group activities.

April: In April, working group members and the public participated in a Joint Working Group Meeting where all six working groups came together for two, all-day meetings. During these two days, working group members reviewed the recommendations from all six working groups and identified recommendations and learnings to be consolidated and to be repositioned as recommendations and learnings. Additionally, working group members identified the timing for each recommendation and evaluated the recommendations' alignment with the MEDSIS Guiding Principles.

May: In May, the Rate Design working group reviewed results from the recommendation timing and principle alignment activities conducted at the April Joint Working Group Meeting and discussed recommendation dependencies and sequencing.

WG4: CUSTOMER IMPACT

August: In August the Customer Impact working group refined their working group description, determined the working group's desired outcomes, identified key questions for the working group to address, and drafted the working group's charter.

September: In September, the Customer Impact working group heard from the New York Department of Public Service on how they addressed costs and benefits of DER, cost shift, apportionment of costs across customer classes and identified topics of interest for future meetings.

October: In October, the Customer Impact working group heard presentations on the current state of customer education and engagement in the District from Pepco and the DC Office of the People's Counsel (OPC). Working group members also learned about

customer education and engagement programs nationally from Oracle, ACCES, and Arcadia Power.

November: In November, the Customer Impact working group learned about low-income customer programs in the District from the D.C. Sustainable Energy Utility (DCSEU) and the Department of Energy and Environment (DOEE), heard from GRID Alternatives Mid-Atlantic and NEST on their low-income programs around the country, discussed DER impacts on low-income populations, and crafted initial recommendations regarding low-income customers.

December: In December, the Customer Impact working group heard from Edison Electric Institute (EEI) regarding case studies of low-income customer programs in other states that included utility DER programs; learned about data access and protection around the country from Mission Data; reviewed current D.C. regulations around customer data protections; and defined data access and protections and their implications in the context of the working group's key questions.

January: In January, the Customer Impact working group finalized the data access and protection impacts on key questions; heard from Home Energy Analytics and Tangent Energy on levels of AMI data access, usage, and best practices; and discussed if prepay programs were appropriate for the District.

February: In February, the Customer Impact working group learned about DOEE's community engagement strategy and resilience hubs in Ward 7, reviewed a consolidated list of low-income programs in the District, discussed disadvantaged customers and the application process for low-income programs, and initiated discussions on working group recommendations.

March: In March, the Customer Impact working group reviewed and developed recommendations from DOEE and DC Office of People's Counsel (OPC), reviewed the Draft Recommendations Document, and confirmed the schedule for the remaining working group activities.

April: In April, working group members and the public participated in a Joint Working Group Meeting where all six working groups came together for two, all-day meetings. During these two days, working group members reviewed the recommendations from all six working groups and identified recommendations and learnings to be consolidated and to be repositioned as recommendations and learnings. Additionally, working group

members identified the timing for each recommendation and evaluated the recommendations' alignment with the MEDSIS Guiding Principles.

May: In May, the Customer Impact working group reviewed results from the recommendation timing and principle alignment activities conducted at the April Joint Working Group Meeting and discussed recommendation dependencies and sequencing.

WG5: MICROGRIDS

August: In August, the Microgrids working group refined their working group description, determined the working group's desired outcomes, identified key questions for the working group to address, and drafted the working group's charter.

September: In September, the Microgrids working group heard a presentation from the Electric Power Research Institute (EPRI) on the challenges associated with cost-benefit analysis for microgrids and developed a list of microgrid benefits.

October: In October, the Microgrids working group reviewed the D.C. Public Service Commission's notice of final rule making on the MEDSIS definition of a microgrid, heard microgrid case studies from the U.S. General Services Administration, identified microgrid business models and ownership models across the country, and identified possible microgrid classifications, ownership structures, and possible applicable regulations in the District.

November: In November, the Microgrids working group developed a list of microgrid assets and classifications, learned from the Energy Storage Association on Maryland's PC44 process and related business models of energy storage to microgrids, and learned about business models and regulatory framework of microgrids from George Washington University.

December: In December, the Microgrids working group heard presentations by the MRC and Pepco regarding microgrid business models and regulatory structures. The working group identified both existing and emerging business models, and evaluated possible costs, revenues and regulatory treatment associated with each business model.

January: In January, the Microgrids working group reviewed compliance standards and retail choice, reviewed lessons learned from other jurisdictions, identified microgrid pilot projects in the District, heard from Navigant on challenges and opportunities around

microgrid business model regulation, and identified regulatory frameworks for microgrids in the District.

February: In February, the Microgrids working group continued to develop microgrid regulatory frameworks and learned from the Chesapeake College microgrid case study.

March: In March, the Microgrids working group learned about the business case for the Gallaudet University microgrid, reviewed the Draft Recommendation Document and microgrid draft recommendations, and confirmed the schedule for remaining working group meetings.

April: In April, working group members and the public participated in a Joint Working Group Meeting where all six working groups came together for two, all-day meetings. During these two days, working group members reviewed the recommendations from all six working groups and identified recommendations and learnings to be consolidated and to be repositioned as recommendations and learnings. Additionally, working group members identified the timing for each recommendation and evaluated the recommendations' alignment with the MEDSIS Guiding Principles.

May: In May, the Microgrids working group reviewed results from the recommendation timing and principle alignment activities conducted at the April Joint Working Group Meeting and discussed recommendation dependencies and sequencing.

WG6: PILOT PROJECTS

October: In October, the Pilot Projects working group refined their working group description, determined the working group's desired outcomes, identified key questions for the working group to address, and drafted the working group's charter.

November: In November, the Pilot Projects working group heard from the DCPSC regarding proposed MEDSIS grant funding parameters as laid out in the staff report, identified pilot parameter criteria gaps and recommendations, and confirmed meeting agendas for the following meetings.

December: In December, the Pilot Projects working group reviewed examples of program and pilot selection criteria from other jurisdictions, such as New York Reforming Energy Vision (REV), Electric Program Investment Charge (EPIC) funding in California, and Department of Energy (DOE) Grid Modernization Laboratory Consortium (GMLC) funding. During this meeting working group member also completed the pilot parameter evaluation gap assessment and continued developing recommendations.

January: In January, the Pilot Projects working group discussed the Pilot Project Grant Funding Parameters from the MEDSIS Staff Report, reviewed other innovative pilots occurring in the industry, discussed Technology Readiness Level (TRL) criteria for MEDSIS Pilots, and discussed pilot project scoring approaches and durations.

February: In February, the Pilot Projects working group reviewed the pilot evaluation strawman and document revision, finalized input on pilot phasing and durations, and confirmed the agenda for the following meeting.

March: In March, the Pilot Projects working group reviewed and refined the pilot evaluation strawman, reviewed and developed recommendations for a pilot governance strawman, reviewed and developed recommendations on pilot phasing and duration, reviewed the Draft Recommendation Document, and confirmed the schedule for remaining working group meetings.

April: In April, working group members and the public participated in a Joint Working Group Meeting where all six working groups came together for two, all-day meetings. During these two days, working group members reviewed the recommendations from all six working groups and identified recommendations and learnings to be consolidated and to be repositioned as recommendations and learnings. Additionally, working group members identified the timing for each recommendation and evaluated the recommendations' alignment with the MEDSIS Guiding Principles.

May: In May, the Pilot Projects working group reviewed results from the recommendation timing and principle alignment activities conducted at the April Joint Working Group Meeting and discussed recommendation dependencies and sequencing.

4.5 Documents Reviewed

Various reports and research papers, industry news articles, case studies, presentations, and other documents were provided to working group stakeholders via the Higher Logic workspace collaboration tool in order to facilitate discussion. A total of 464 documents were either created, provided or posted into the workspace during this process. In some cases these materials were provided for reference only. In other cases, they were provided as pre-read material prior to meetings. Documents were usually provided by SEPA as part of the facilitation process or, in some cases, at the suggestion of a stakeholder. Stakeholders were also able to upload documents to the workspace.

A complete list of the documents uploaded to the Higher Logic workspace and made available for review by the working group members is listed in Appendix A.7. Note, the public can gain access to all documents that are in the DC MEDSIS workspace in the Higher Logic Platform. To gain access to the workspace and working group documents visit the D.C. grid modernization website and fill out the application form at the bottom of the homepage.

4.6 Strawman Proposals

Each working group began thinking more about the ultimate recommendations they could make to the DCPSC as they progressed through their agendas and efforts to address the key questions and outcomes expressed in their charters during the education phase of meetings. To facilitate this process both SEPA, as the facilitator, and individual working group participants began to develop proposals to help shape recommendations.

In SEPA's case, these proposals took the form of a "strawman" designed to consolidate the findings and conclusions resulting from the working group for stakeholder review, their modification and eventual approval or rejection. These strawmen were developed based on discussions documented in meeting minutes or from the results of working group exercises conducted in the meetings or from the results of surveys conducted between meetings. In all cases, these strawmen served as a visual tool to document discussions and solicit working group input. The strawmen served to confirm the working group's thinking on a topic and clarify any areas of misunderstanding or differences of opinion.

Similarly, individual stakeholder proposals were made to the working group in the form of presentations, submittals to the Higher Logic workspace, or organized discussions in a working group meeting. As with the SEPA generated strawmen, the goal of these proposals was to solicit a common understanding of positions from the working group regarding a specific topic in an effort to generate recommendations with broad overall support.

A summary of the proposals discussed by the working group is presented below in Table 4.2. The complete text for each stakeholder proposal is provided in Appendix A.6.

Proposal/ Strawman	Originator	Working Group
D.C. Climate Action's Proposal for Integration of the New Interconnection and Interoperability IEEE Standard 1547-2018 & Advanced Inverter Functionalities in the District of Columbia	DC Climate Action	WG2 - NWA

Proposal/ Strawman	Originator	Working Group
Pepco's Proposal for a District of Columbia Stakeholder-Informed Distribution System Planning and NWA Consideration Process	Pepco	WG2 – NWA
Grid2.0 & D.C Consumer Utility Board's Proposal for a Performance Incentive Mechanisms and Non-Wires Alternative MEDSIS Pilot	Grid2.0 / DCCUB	WG1 – DIAA, WG2 – NWA, WG3 – Rate Design WG6 – Pilot Projects
D.C. Climate Action's Proposal For Public Service Commission to Explore Potential for Commercial Rate Design to Incentivize Peak Load Shifting And Demand Reduction	DCCA	WG3- Rate Design
DOEE and Urban Ingenuity' Proposal on a new approach to solar saturation, aggregation and a possible NWA demonstration	DOEE / Urban Ingenuity	WG2 – NWA
Sunrun's Bring-Your-Own-Device (BYOD) Peak Demand Management Proposal: Meeting Utility and System Needs with Residential Solar+Storage	Sunrun	WG2 – NWA
Pilot Project Screening and Scoring Strawman	SEPA	WG6 – Pilot Projects
SEPA's DER Ownership Strawman	SEPA	WG2 – NWA
SEPA's Advanced Inverter Definition Strawman	SEPA	WG2 – NWA
SEPA's NWA Definition and Classification Strawman	SEPA	WG2 – NWA
Pepco's Microgrid Business Model Strawman	Pepco	WG5 – Microgrids
MRC Microgrid Business Model Strawman	MRC	WG5 – Microgrids
SEPA Performance Incentive Mechanism Strawman	SEPA	WG3 – Rate Design
SEPA Regulatory Framework for Microgrids Strawman	SEPA	WG5 – Microgrids
SEPA Pilot Project Governance Structure Strawman	SEPA	WG6 – Pilot Projects
SEPA Pilot Project Phase Timeline Strawman	SEPA	WG6 – Pilot Projects

Table 4.2 – MEDSIS Strawman Proposals

4.7 Working Group Process Lessons Learned

This section provides SEPA's input, as the MEDSIS Working Group facilitator, on lessons learned from conducting the working group process. The content reflects SEPA's perspective only and not that of the other stakeholders involved.

SEPA's methodology for conducting the working groups consisted of three phases:

1. Establishing the working group,
2. Facilitating the working group,
3. Reporting working group results.

This methodology was employed for the MEDSIS working group process. Lessons were learned in all three phases and we feel these lessons would be valuable for the Commission's consideration in future working group efforts.

Establish the Working Group

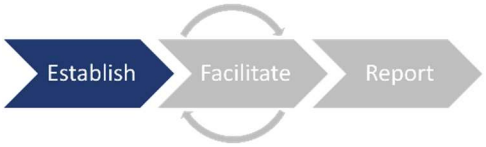


Figure 4. 9 – Establish the Working Group Phase

This phase consisted of tasks to establish the work plan, configure the infrastructure for the workspace platform, and recruit working group members. Lessons learned included:

1. Having a workspace platform for sharing of documents and correspondence is important for ensuring transparency. We used HigherLogic for this process. Having a dedicated place where emails and documents resided worked well.
2. Utilizing multiple channels to make the public aware of the working groups worked well. Examples include posting to the DCPSC site, running blogs, and email pushes from various distribution lists. This resulted in a diverse and broad set of stakeholders.
3. Keeping registration open to the public so that all interested stakeholders could be afforded the opportunity to join during any time in the process allowed for easy access.
4. Allowing for remote participation created more work for the facilitator to manage, but it allowed for access for all those who could not travel.
5. Staggering specific working groups (NWA and Pilots) to allow time for level setting and charting a common framework and roadmap (DIAA WG / U.S. DOE Grid Mod Strategy and Planning Process).

Facilitate the Working Group

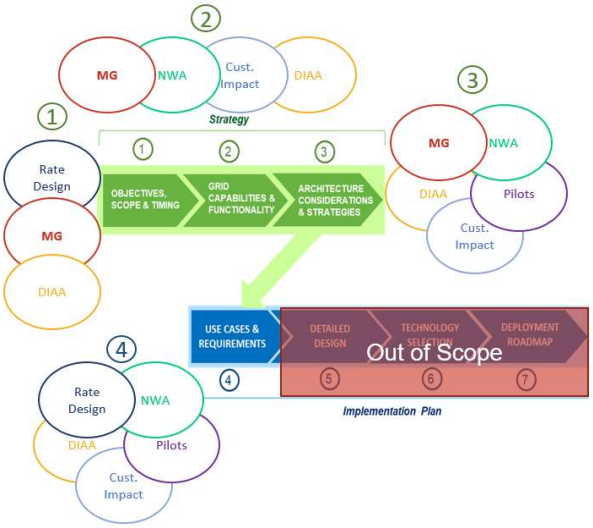
Figure 4. 10 – Facilitate the Working Groups

The Facilitating the Working Group phase consisted of organizing the meetings. This included all logistics, meeting agendas, development of pre-read materials, and facilitation of member participation and attendance. This phase also involved the facilitation of each working group meeting, which included presentations, meeting notes, and meeting follow-up activities. Finally, this phase involved

documentation tasks associated with working group activities in meeting minutes, development of strawman proposals, development of surveys to solicit member input, and the capture of action items. These activities were completed monthly for all working groups.

Lessons learned included:

1. Participants should be trained and proficient on the use of any working group collaboration tools or workspace platform. This includes administrative steps for ensuring access to the site as well as taking advantage of all the site's functionality. Leveraging online workspace platforms can be a great aid to the efficiency of working group communications and data sharing as well as serve as a log of all working group communications if used fully.
2. Development of working group charters is a key first task for ensuring the working group has a shared understanding of expectations, goals, and objectives.
3. Working groups should have a set of "NorthStar" principles or objectives that dictate working group activities. For the MEDSIS working groups, this was the MEDSIS Vision Statement and Guiding Principles. While these principles were key in helping direct the working groups' efforts, we quickly learned these principles at times could be in conflict with each other (affordability vs. sustainability, interactive vs. secure, non-discriminatory vs. interactive, safety vs. affordability, reliability vs. sustainability) when discussed in context of certain grid modernization topics. As such, making recommendations to achieve the overall MEDSIS Vision involved balancing each of the principles to understand the implications of the recommendation on each.
4. Working groups should begin with a process of charting a common framework and roadmap for grid modernization strategy and a planning process. By looking at the U.S. DOE's Grid Mod Strategy and Planning Process shown in Figure 4.11, the working group was able to determine what processes were in and out of scope of the MEDSIS Stakeholder Working Group Process. It is important to identify these processes and their impacts on working groups prior to starting the working group process. This required a dedicated effort that involved staggering working groups to allow time to first establish a common framework and roadmap.



Step	Grid Mod Strategy & Planning Process	Impacted Working Group
1	Objectives, Scope & Timing	Rate Design, Microgrid, DIAA
2	Grid Capabilities and Functionality	Microgrid, NWA, Customer Impact, DIAA
3	Architecture Considerations & Strategies	Microgrid, NWA, Pilots, Customer Impact, DIAA
4	Use cases & Requirements	Rate Design, NWA, Customer Impact, Pilots, DIAA
5	Detailed Design	Out of Scope
6	Technology Selection	Out of Scope
7	Deployment Roadmap	Out of Scope

Figure 4. 11 – U.S. DOE Grid Mod Strategy & Planning Process for MEDSIS

5. There should be a balance of time allocated to stakeholder education versus time for development of working group recommendations. While working group members often want to dig in on topics immediately in an effort to move fast, we learned the level of understanding on topics across working group members is so vast that progress can only be made by first level setting and educating members. This takes time which few recognize until they go through the process. As a result, less time can be allocated to actual development of recommendations. However, when allowing members or outside industry representatives to speak to the working group, presentation time should be limited and focused on learnings or suggestions that can be applied to the working group's objectives. We found many companies just want to present what they were doing as opposed to suggestions on a path forward or lessons learned that could be applied to MEDSIS. In the future, a more efficient and beneficial approach might entail organizing a full-day workshop focused on education before diving into the working group process.
6. Developing recommendations as early in the working group process as possible is recommended. This does conflict with Lesson 4 above, but there could be ways to resolve this conflict. These include:
    a. Summarize recommendations and areas of agreement after each meeting in an effort to avoid stakeholders later forgetting what they agreed upon or reacting differently when they see the summarized input in writing at the end of the working group process. This was done in the meeting minutes provided after each meeting but it was not clear how much the stakeholders referenced the meeting minutes. In some cases this summary information may not have been easy to find in the meeting minutes due to their length but most major topics were recorded at the beginning of the meeting minutes as "Key Takeaways".

b. Develop a common understanding around the utility and District energy policy landscape as a way to develop strawman draft recommendations that resonate with and can be supported by a diverse cross section of stakeholder groups.

c. Invite recommendations from members early in the process. Waiting too long results in members all wanting to present their thoughts at the same time. This results in insufficient time for all recommendations to be vetted in the working group meetings and requires review outside of meetings via surveys or document reviews which is less productive and collaborative.

7. Transparency is key to a collaborative working group process. This can be accomplished through open communications via an online collaboration tool and by thoroughly documenting meeting minutes. Also, by recording all meetings, members were afforded the opportunity to revisit conversations, if needed. Allowing all members to see which company said what and having all information available to all members adds to transparency and ensures an open process. All companies having the ability to post to the workspace and ensure their company comments were properly recorded ensured accuracy and full visibility of input. The effort to fully document comments by company name for each of the six working groups for every meeting was time consuming but added greatly to transparency. Future working groups should carefully assess the time commitment related to this effort.
8. Arranging for subject matter experts who provide topical examples that could move the working group forward takes a material amount of time. This was not fully appreciated at the start of the process. While stakeholders were encouraged to recommend examples and speakers and provide materials, the majority of this work fell on the facilitator.
9. While the DCPSC did have various staff assigned to each working group, their inability to fully engage because of the DC advisory and litigation staff not being separate resulted in perceptions from stakeholders that the Commission was not engaged. Further efficiencies could result if there was separation since the Commission staff has broader knowledge than many of the participants.

Working Group Reporting

The Working Group Reporting phase included ongoing tasks related to status reporting between the MEDSIS Consultant and the DCPSC as well as development and submittal of the final working group reports from the working group process.

Figure 4. 12 – Working Group Reporting Phase

Lessons Learned included:

1. Agree upon the working group outcome document format up front and craft learnings and findings after each meeting along with a running list of recommendations. This would not only get stakeholders thinking about recommendations earlier but encourage discussion regarding those which would, arguably, result in greater agreement regarding the recommendation language in the final report.
2. We found that participants were more reluctant to bring forth ideas in writing. This required the facilitator to develop strawman proposals and ideas in writing to the group to stimulate input. Researching and developing draft strawmen to solicit stakeholders' input required a material amount of time.
3. There should be flexibility in how working group members submit comments. Ideally, all working group members would use the same process and tools for submitting comments. For large documents such as the final working group report, this becomes challenging due to the individual capabilities and resources of working group members and because added flexibility also results in an increased burden on the facilitator to manage member input. Ensuring working group member input is received accurately and in its entirety is the key to resolving this. Providing multiple channels (email, workspace, in person meetings, or phone calls) to facilitate member comments is recommended, but it should be recognized this will require more time from the facilitator.
4. For future stakeholder working groups, facilitators should be prepared to recruit working group members; research, drafting and develop strawman proposals, and conduct individual follow-ups with stakeholders outside of the working group meetings, as well as facilitate the meetings. We found the role was beyond pure facilitation, in particular when it came to developing outcomes and recommendations. If working groups are pure education and learning then the approach might lend itself more towards pure facilitation.

5 Recommendations and Learnings

While Chapter 4 provides a complete summary of the working group process including the charters, stakeholders, topics, and documents that influenced the working group process, Chapter 5 is the output of that process.

The major objective of the MEDSIS working group process was to develop recommendations for the DCPSC's consideration around concepts, actions, programs, initiatives or projects that could be conducted in the District and would further the MEDSIS vision. To accomplish this the MEDSIS Consultant's initial approach was to document areas of consensus and areas of contention as a way to shape recommendations. As meetings were conducted, stakeholders gave feedback they were uncomfortable with the concept of "consensus" because:

A. Not all stakeholders attended all working group meetings so differing opinions were often offered over time as stakeholders engaged and disengaged in the process

B. Topics agreed to in principle during a working group verbal discussion, once documented, didn't always result in continued agreement once reviewed in written form

C. Furthermore, stakeholder ideas and perspectives may have changed over the course of the proceeding as new information was factored in.

For these reasons, the working group moved away from attempting to document areas of consensus and instead decided to document the working group's findings as coherently as possible while ensuring what was documented consistently agreed with discussions or positions that occurred during the meetings. This approach led the working group to define two levels of suggestions that could be made to the DCPSC from the working group process:

1. Recommendations – concepts, actions, programs, initiatives or projects that had been fully vetted by the working group. Recommendations were also defined with specificity or with sufficient detail to be actionable by the DCPSC.
2. Learnings – concepts, actions, programs, initiatives, or projects that had been discussed by the working group but for which there was not enough detailed information to make a recommendation.

Both Recommendations and Learnings were documented and included in Chapter 5 as the working group felt each merited the full attention of the DCPSC. While it is each working group's expectation the DCPSC fully consider each Recommendation and take action accordingly, it is also recognized that Learnings could be advanced by the DCPSC for further investigation if the Commission felt there was prudence to do so.

Taking this approach placed an increased emphasis on accurately capturing each stakeholder's input or position and to providing enough background information for the DCPSC to understand the working groups' thinking.

Therefore, Chapter 5 format is organized as follows:

- Sub-section 5.X – Working Group Name. Includes a table listing the Recommendations and Learnings included in the sections that follow.
    - Sub-section 5.X.X – Recommendation Name
        - Sub-section 5.X.X.1 – Recommendation description taking into account all the detailed input and comments received by each working group.
        - Sub-section 5.X.X.2 – Background discussion explaining how the working group arrived at the Recommendation. This section includes key stakeholder input or exercises/ documentation from the working group meetings that contributed to the Recommendation.
        - Sub-section 5.X.X.3 – Stakeholder positions offered as formal comments against the draft Recommendations circulated for stakeholder review.
    - Sub-section 5.X.X – Learning Name
        - Sub-section 5.X.X.1 – Background discussion explaining how the working group arrived at the Learning. This section includes key stakeholder input or exercises/documentation from the working group meetings that contributed to the Learning.
        - Sub-section 5.X.X.2 – Learning conclusion taking into account all the detailed input and comments received by each working group.
        - Sub-section 5.X.X.3 – Stakeholder positions offered as formal comments against the draft Learning circulated for stakeholder review.

In the recommendation descriptions, some of the recommendations and learnings specify using funds from the $21.55 million in the MEDSIS Pilot Project Fund Subaccount created under Formal Case No. 1130. Those recommendations include:

1. 5.1.2 Recommendation – DCPSC to develop benefit cost analysis (BCA) methodology
2. 5.1.6 Recommendation – DCPSC to develop publicly available system-level data webpage
3. 5.3.2 Recommendation – DCPSC to initiate a value of DER and value of grid study
4. 5.5.10 Learning - Opportunity to leverage MEDSIS Funds to Pilot Multi-customer Microgrids in the District

For all other recommendations and learnings, the funding source was not specified by the working groups although some stakeholders, in their position statements, offered input on if the use of MEDSIS funds was appropriate.

Many of the recommendations and learnings were discussed by a number of working groups but for simplicity of reading, they are listed once. Before each section a table is provided indicating which groups inspired or discussed the recommendation or learning.

The recommendations and learnings begin below starting with Working Group 1 Data and Information Access and Alignment (DIAA).

5.1 Data and Information Access and Alignment

5.1 Data Information Access and Alignment							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.1.1	DCPSC to Explore Metric for Evaluating Carbon Footprint Impact of DER Projects	x	x			x	x
5.1.2	DCPSC to Develop Benefit Cost Analysis (BCA) Methodology	x	x				
5.1.3	DCPSC to Align MEDSIS with Clean Energy DC Act	x	x	x	x	x	x
5.1.4	DCPSC to Continue to Improve Small Generator Interconnection Process	x	x		x	x	
5.1.5	DCPSC to Revise Language in MEDSIS Vision Statement	x					
5.1.6	DCPSC to Develop Publicly Available System-Level Data Webpage	x	x	x	x		
5.1.7	DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis	x	x				
5.1.8	DCPSC to Direct Pepco to Create a Secure Web Portal for RFP Responses and Programmatic Data Requests	x	x		x		
5.1.9	Apply MEDSIS Guiding Principle Metrics for General DCPSC Decision Making	x	x	x	x	x	x
5.1.10	Learning: Balance System-Level Data Availability with Security and Affordability	x	x		x		

Table 5. 1 – WG1: DIAA Recommendations and Learnings

5.1.1 RECOMMENDATION - DCPSC TO EXPLORE METRIC FOR EVALUATING CARBON FOOTPRINT IMPACT OF DER PROJECTS

5.1.1.1 Recommendation

DCPSC should explore the development of a metric for evaluating carbon footprint impact of distributed energy resource (DER) projects—including, but not limited to solar photovoltaics (PV), microgrids, energy efficiency (EE), electric vehicles (EV) and combined-heat-and-power (CHP). This metric could be integrated into the evaluation of non-wires alternatives (NWAs). The metrics to explore include but are not limited to tCO2e/MW[3], tCO2/MWh[4] and tCO2e/kBtu[5].

5.1.1.2 Background

During the October and November 2018 DIAA Working Group ("WG1") meetings, stakeholders discussed the Public Service Commission of the District of Columbia ("DCPSC") MEDSIS Guiding Principles[6] and proposed adding additional measurable objectives or recommendations to each existing principle. Grid2.0, USGBC, Pepco, DOEE, and EEI all provided written comments on each of the principles and WG1 developed several recommendations intended to further the MEDSIS Vision.

5.1.1.3 Stakeholder Positions

A. AOBA is in support and stated that "every proposal should be subject to cost and benefit criteria." AOBA "supports integration of the data, impacts and revenues from the recently announced Transportation and Climate Initiative to design a new regional low-carbon transportation policy proposal that would cap and reduce carbon emissions from the combustion of transportation fuels, and invest proceeds from the program into low-carbon and more resilient transportation infrastructure." AOBA also "supports integration of any MEDSIS outcomes with the Sustainable DC 2.0 working groups and expected June 2019 draft report." AOBA proposes that the "District of Columbia climate, environmental, energy and sustainability policies, laws and regulatory requirements must be fully integrated with the Commission, DOEE and other legal and regulatory requirements in order to avoid redundancy and imprudent spending while ensuring transparency and least cost for the benefits expected." AOBA also proposes "that the District of Columbia issue an annual report on the government wide climate, environmental, energy and sustainability policies, laws and regulatory activity, including all projects, their costs and benefits and their status at the time of the report."

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[3] Ton of Carbon Dioxide Equivalent per Megawatt Produced

[4] Ton of Carbon Dioxide Equivalent per Megawatt-hour Produced

[5] Ton of Carbon Dioxide Equivalent per Kilo-British-Thermal-Units Produced

[6] Sustainable, Well-Planned, Affordable, Secure, Safe & Reliable, Interactive, Non-Discriminatory

B. D.C. Climate Action (DCCA) supports this recommendation conditionally, adding that the "original wording of the recommendation "DCPSC to Develop" should be restored or replaced with "Establish" to eliminate ambiguity. This metric would be an important one in implementing the methodologies proposed in 5.1.2 (BCA Methodology) and 5.3.2 (Value of DER and Grid Methodology)."

C. DC Office of the People's Counsel (OPC) supports a metric for carbon footprint as well as DOEE's reasoning. DOEE conditionally supports this recommendation, stating that "the general idea was to propose that PSC adopt a cost of GHG emissions in evaluating utility programs and expenditures. This cost also should be a part of the locational value of DER. It does not make sense only to evaluate the GHG emissions of DER as it is currently written--rather it's about comparing the GHG emissions profile of DER vs. traditional types of projects and expenditures.

D. DOEE conditionally supports this recommendation, stating that "this is the only recommendation that explicitly considers the impact of GHG emissions, and therefore this is a very important priority for DOEE, which initiated the discussion of the original concept. However, during the workgroup meeting, this idea was distorted despite DOEE's protests, and the recommendation currently removes the core idea of using the GHG emissions criterion to evaluate all projects, programs, and initiatives that are subject to PSC review and approval. The result is that this idea is now a barely useful tool for measuring "dirty" DER vs "clean" DER. This was never the original intent. Again, the general idea was to propose that PSC consider the impact of GHG emissions in all programs, projects, initiatives, and rules subject to PSC review and approval. One way of doing that could be to adopt a cost of carbon, but that may not be the only way to address the issue. This cost could be a part of the Benefit Cost Analysis framework or the locational value of DER, or both, which are recommendations in other sections. What is clear is that it does not make sense only to evaluate the GHG emissions of DER as it is currently written--rather it's also about comparing the GHG emissions profile of DER vs. traditional types of projects and expenditures. One concrete suggestion is for PSC to consider adopting EPA's social cost of carbon as an implicit cost of projects (for the time being until a more robust, updated carbon cost can be evaluated and adopted) that use fossil fuels or electricity from power plants using fossil fuels, which would include transmission and distribution lines and pipes (to the extent that they import fossil-fuel sourced electricity and natural gas). DOEE also stated that "carbon accounting should not be limited to DER, but to *all* energy investments - a carbon accounting for DER by itself has little to no inherent value. Although DOEE previously stated that it may oppose this recommendation if the original intent was not restored, DOEE still conditionally supports this recommendation, with the strong objections that it is now compelled to record. Again, the April meetings resulted in the removal of the language "business as usual" as a comparison to DER for a carbon metric at the request of Pepco and EEI. At the very least, DOEE suggests replacing "business as usual" with "projects that require energy

input from fossil fuels." DOEE maintains its strong objection that the only recommendation in this entire 600+ page report to explicitly address a central driver of MEDSIS, i.e. GHG emissions and sustainability, has been so badly distorted as to be rendered almost useless. DOEE supports this recommendation only on the condition that the Commission restore the original intent of this recommendation and correct the error.

E. EEI supports this recommendation with changes to section 4. Specifically, EEI believes the language should be removed about tying customer energy usage to their environmental impact. EEI does not support creation of a bill/customer platform element that would include estimated GHG reductions and other environmental elements. Creation of such an element, while an excellent idea, would be highly misleading, as the true environmental or carbon footprint of an electric customer is less a feature of their energy usage than other home elements (windows, doors, insulation), of which PEPCO has little to no control. It is not practical or valuable to customers to create an environmental monitoring or customer benchmark tool that doesn't give useful or accurate information.

F. General MicroGrids supports this recommendation.

G. Grid2.0, D.C. Consumer Utility Board (DCCUB) and D.C. Chapter of Sierra Club support this recommendation with a suggested addition. Grid2.0/DCCUB/Sierra Club recommend that this metric should be designed and then tracked to determine its suitability to evaluate carbon intensity of different build/management options for the grid as a consideration for inclusion as part of a future PBR rate regulation. The importance of this metric is that it can provide important data for comparing grid design options, as well as providing data on the overall carbon intensity of utility performance year evaluations.

H. GRID Alternatives Mid-Atlantic conditionally agrees with this recommendation. GHG impacts should be evaluated and prioritized for both DER projects and other, more traditional types of projects, as recommended by DOEE and other stakeholders. In addition, this evaluation should not eclipse metrics accounting for other equity impacts, such as removing disproportionate pollution burdens, remedying health disparities, and promoting energy savings. Maximizing GHG reductions should coincide with maximizing the equity of the energy transition, and underserved communities should not face disproportionate impacts arising from application of carbon footprint impact evaluation metrics.

I. New Columbia Solar (NCS) conditionally agrees with this recommendation, stating that carbon footprint impacts should be evaluated for both DER projects and other, more traditional types of projects, but this evaluation should also allow for accounting for other equity impacts.

J. Pepco supports this recommendation.

K. Solar United Neighbors of DC (DCSUN) agrees with and supports the goal of this recommendation. However, for the Commission's consideration, any carbon

footprint metric must include a lifecycle analysis of traditional or "business-as-usual" utility investments. For instance, utilities in New York that have developed BCA frameworks for gas do not consider the gas lifecycle (extraction well to burner tip), and either do not at all or do not fully include methane emissions.

L. Sunrun supports this recommendation.

M. WGL Energy supports this recommendation as long as the metric considers both the benefits and the costs of DER projects.

5.1.2 RECOMMENDATION – DCPSC TO DEVELOP BENEFIT COST ANALYSIS (BCA) METHODOLOGY

5.1.2.1 Recommendation

DCPSC should develop a white paper on a BCA methodology framework that incorporates environmental and health benefits along with indirect costs of stranded assets. The white paper on BCA framework should take into account and evaluate different methodologies in light of the MEDSIS Guiding Principles, as well as examining proceedings undertaken in other jurisdictions. The white paper could be the first step for the DCPSC to issue an eventual order for a BCA framework to be used for assigning benefits and costs in evaluating NWAs to grid investments. Any costs associated with developing white paper on a BCA methodology framework should come out of the MEDSIS Pilot Fund. DCPSC should ensure that the development of a BCA methodology framework in the District does not delay any NWA consideration processes in distribution system planning. The BCA methodology and framework could be integrated into any NWA consideration processes as they evolve.

5.1.2.2 Background

During the October and November 2018 DIAA Working Group meetings, the working group discussed the Commission's MEDSIS Guiding Principles and proposed adding additional measurable objectives or recommendations to each existing principle. Grid2.0, USGBC, Pepco, DOEE and EEI all provided written comments on each of the principles and the working group developed several recommendations intended to further the MEDSIS vision. The working group developed a recommendation intended to advance an affordable energy delivery system. It specifically addressed the possible value of developing a BCA methodology that could incorporate environmental and health benefits.

As part of this discussion, Advanced Energy Group provided the N.Y. DC PSC Staff BCA White Paper Final[7] and Final Order[8] establishing the Benefit Cost Analysis Framework in New York. Some stakeholders in the NWA Working Group also expressed interest in identifying the existing BCA framework and developing recommendations for shared, consistent methodologies for assigning benefits and costs of NWA projects. A BCA framework that accounts for environmental benefits could incentivize DER project development; however, it could also result in contentious proceedings regarding underlying assumptions and assigned values.

5.1.2.3 Stakeholder Positions

A. DCCA supports this recommendation conditionally, recommending to "apply the BCA to all energy distribution investments including gas."

B. DCSUN agrees with this recommendation but requests to add some language to the background section. In [Section 5.1.2.2], in the last line after "environmental benefits" DCSUN suggests including "and potentially addresses DC's need to increase equity." Further the White Paper should address providing a framework for gas and electric business, fully value externalities and non-energy benefits, and take a long-term view and system-wide approach of traditional assets. For example, in the case of gas, the framework has to evaluate methane emissions from the extraction well to the burner tip, not just leakage along the distribution system or only carbon emissions resulting from combustion.

C. DOEE conditionally supports this recommendation. DOEE stated that "the BCA Methodology should include some way of accounting for the cost of carbon emissions and other measurable environmental impacts, and be applied to all electricity and natural gas system investments." To illustrate the purpose of this recommendation, DOEE notes that a more comprehensive BCA that includes measurable environmental impacts will give the Commission the tools necessary to implement its new mandate on climate change, including the evaluation of WG's pilot program subsidizing the cost of natural gas pipes for new affordable housing projects. DOEE also stated that this BCA should "encompass the element of locational value of DER."

D. EEI opposes this recommendation. EEI primarily disagrees with this recommendation because there was no substantive discussion of a BCA within the DIAA working group. While there is surely a need to develop a method of determining the costs versus benefits of pilot projects such as non-wires alternatives, the elements of the BCA need careful consideration. For example, BCA methodologies should never incorporate externalities such as social or

[7] http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/c12c0a18f55877e785257e6f005d533e/$FILE/Staff_BCA_Whitepaper_Final.pdf

[8] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bF8C835E1-EDB5-47FF-BD78-73EB5B3B177A%7d

health benefits that are inherently speculative and for which there is no market or market-based proxy.

E. Fluence opposes this recommendation, stating that "while formalizing a benefit cost analysis methodology is generally worth pursuing, [Fluence] is concerned that the proposed study would potentially delay the implementation of the proposed NWA process, to the detriment of D.C. residents." Fluence continued stating that "good work has been done in other states and jurisdictions on environmental impacts on non-wires alternatives and other benefits, and [Fluence] encourages stakeholders to bring forward relevant findings when actual NWA projects are proposed."

F. General MicroGrids supports this Recommendation, but suggest adding in the text that this includes addressing DER resources in connection with Grid integration. GMI supports developing this White Paper to review and evaluate different methodologies to advance the MEDSIS Vision and objectives. This is crucial as a first step to developing a BCA regulatory framework. Such a BCA methodology framework is important to enable comparing non-conventional DER investment/procurement options against traditional options and would benefit NWA evaluations and other procurements/investments.

G. Grid2.0/DCCUB/Sierra Club supports this recommendation, stating that "With the serious consideration of modern alternatives to the existing BCA valuation method, Grid2.0/DCCUB/Sierra Club now endorses Recommendation 5.1.2." Grid2.0/DCCUB/Sierra Club asserted that "Based on discussions during the DC MEDSIS proceeding and similar analyses done on this subject in CAISO and for NY REV, it would be unwise for the DCPSC just to tack environmental and health benefits onto the existing PEPCO BCA valuation method. A modern BCA methodology in DC should properly be guided by the MEDSIS Principles, which are only a small part of the existing BCA. The NY REV proceeding compared several different methods for BCA, including a "societal test" as well as the existing utility BCA. Given the objectives of the NY REV, the NYPSC approved the use of a "societal test" to drive the BCA, not the old Utility BCA. The DCPSC needs to consider similar modern methods to deliver on its principles. The existing utility BCA is grounded only on costs/benefits over which the utility has control. This orientation could well affect the way in which environmental and health benefits are addressed and valued. In addressing the merits of different BCA tests, the DCPSC, Pepco and stakeholders can draw upon the information and views provided in the NY REV process to address the appropriate BCA for DC."

H. GRID Alternatives MidAtlantic and NCS (Grid Alternatives MidAtlantic / NCS) conditionally supports this recommendation and states that environmental and health costs and benefits of NWAs and other grid investment decisions must be viewed as broadly and comprehensively as possible. In addition, those costs and benefits that fall on already burdened populations (such as low-income

communities and communities of color) should be given extra weight, because inequity is itself a cost, and reducing inequity is a benefit.

I. GridWise Alliance offered a statement of understanding that "all NWA projects undertaken via the proposed DSP/NWA process will be subject to a DCPSC prudency review through a subsequent rate case process."

J. Microgrid Architect offered an alternative proposal to consider a market-based mechanisms that may be more straightforward than a BCA methodology and also result in increased rate-payer savings.

K. OPC conditionally supports this recommendation. OPC believes that a cap and/or range should be established. And that a clear scope of the development of the white paper on a BCA methodology framework coming out of the MEDSIS Pilot Fund.

L. Pepco opposes this recommendation for the following reasons:

   a. The subjective nature of the externalities this recommendation suggests be incorporated in a BCA Methodology is more likely to result in a number of contentious proceedings regarding underlying assumptions and assigned values than an advancement of MEDSIS principles.

   b. All NWA projects undertaken via the proposed DSP/NWA process would be reviewed by the DCPSC through a subsequent rate case process. It is during this rate case review that the DCPSC can evaluate the prudency and costs of NWA solutions relative to their benefits consistent with the current DCPSC practice.

M. Sunrun supports this recommendation.

N. WGL Energy supports this recommendation.

5.1.3 RECOMMENDATION – DCPSC TO ALIGN MEDSIS WITH CLEAN ENERGY DC ACT

5.1.3.1 Recommendation

DCPSC projects, programs, and initiative decision making should align with provisions of the Clean Energy DC Act[9].

5.1.3.2 Background

During the discussions over the DCPSC MEDSIS Guiding Principles, stakeholders agreed about using the Clean Energy DC Act as guiding posts for the MEDSIS process. WG1 developed a recommendation intended to advance a sustainable energy delivery

[9] CleanEnergy DC Omnibus Amendment Act of 2018

system, specifically addressing the alignment of MEDSIS to the Clean Energy DC Act. Provisions of the Clean Energy DC Act include, but are not limited to:

1. Public transportation and private vehicle fleets to be carbon free by 2045
2. 100% renewable electricity by 2032; Recommendation 5.1.1 and 5.1.2 will aim to establish metrics for environmental benefits and resulting cost impacts on electricity customers associated with advancing new renewable sources of electricity in the District.
3. 10% local solar by 2032; DCPSC should encourage local generation of renewable energy credits (RECs) in the District consistent with the metric included in the "Pilot Project Screening and Scoring Template" referenced Recommendation 5.6.2.
4. Promote reduction of building energy consumption. Recommendation 5.2.3 will aim to include newly legislated building codes and energy standards into Pepco's load forecast and planning process.
5. Promote electrification of local transportation – consistent with Clean Energy DC goals.

5.1.3.3 Stakeholder Positions

A. AOBA supports this recommendation.

B. Coalition for Resilient DC (CRDC) supports this recommendation, but recommends the following: "The passage of the Clean Energy DC Act (CEDC) puts forth aggressive targets to reach our climate goals by decarbonizing our electric and transportation sectors - an opportunity at which grid modernization is foundational. If done right, grid modernization's role in decarbonization will create one of the greatest wealth creation opportunities in the history of the District with the potential to create a new era of economic opportunity, innovation and social justice. This is because the development of the 21st Century Energy Economy will come from unlocking the value of the electric distribution system - which is within the purview of the PSC. As such, it is within PSC's mandate to ensure any and all efforts to accelerate grid modernization maximize the benefits for the District holistically spurring economic development, aligning with our climate goals while protecting ratepayers.

C. DCCA supports this recommendation.

D. DCSUN abstains from stating a position.

E. DOEE conditionally supports this recommendation, stating that the "PSC could issue a new set of regulations relating to climate change. In addition, [#4 of the background section] should include the impact of new building codes, as well as the building energy performance standards, in the load forecast and planning process." DOEE believes that the Commission should take a broad view, where appropriate, of its new mandate to support the DC government's climate change goals and targets rather than taking a narrow view that would apply its mandate

only to specific programs authorized under the Clean Energy DC Omnibus Act. For example, taking a narrow view would limit PSC review of natural gas programs and projects because most of the programs created under the Omnibus Act are electric programs; DOEE does not believe this is the intent of the legislation giving a broad climate change mandate to the Commission. PSC should exercise broad discretion to review the impact of climate change on all programs and projects.

F. EEI supports this recommendation.

G. General MicroGrids supports this recommendation.

H. Grid2.0/DCCUB/Sierra Club supports this recommendation.

I. GRID Alternatives MidAtlantic generally supports this recommendation. GRID agrees with DOEE that the DCPSC should take a broad view and support all of the DC government's climate change goals and targets.

J. NCS generally supports this recommendation.

K. OPC supports recommendation. Additionally, should the DCPSC decide to institute a working group as suggested by DC Counsel, OPC would actively participate; however, it is somewhat unclear what capacity the WG serve which should be clearly formulated by the Commission.

L. Pepco supports this recommendation.

M. Sunrun supports this recommendation.

N. WGL Energy neither supports nor objects to this recommendation since it requires an alignment of new rules with new law.

5.1.4 RECOMMENDATION – DCPSC TO CONTINUE TO IMPROVE SMALL GENERATOR INTERCONNECTION PROCESS

5.1.4.1 Recommendation

DCPSC should give oversight to Pepco to continue to improve its Small Generator Interconnection Process[10] to facilitate DER deployment in the District.

5.1.4.2 Background

Stakeholders discussed how the DCPSC and MEDSIS should continuously seek to evolve the small generator interconnection process and create revenue mechanisms that reward or penalize Pepco for increased efficiency in the interconnection process. In interrelated case, Formal Case No. 1050 (FC1050), the DCPSC issued a notice of final rulemaking in the matter of the investigation of implementation of interconnection standards in the District of Columbia on January 25, 2019. Among many items, FC1050

[10] https://www.pepco.com/MyAccount/MyService/Pages/DC/ConnectingYourSystemtotheGrid.aspx

addresses the evolution of best practices of interconnection for small generators (less than 10MW) over time, amendments to IEEE 1547 and the rapidly evolving nature of interconnection rules. The order directed Pepco to make several significant changes to the interconnection criteria, Supplemental Review Process, capacity size limit and other criteria for each level of review, and introduced compressed timelines into the different areas of the interconnection process. Pepco is currently in the process of making changes pursuant to the order and evolving its processes.

5.1.4.3 Stakeholder Positions

A. AOBA supports this recommendation, stating that "there must be third party access to Pepco's owned and operated grid, at affordable rates, in order to sustain and further evolve existing competition for energy related goods and services." AOBA supports "third party interconnection with Pepco's owned and operated grid in order to facilitate District customers' utilization of competitive service alternatives at affordable costs in order to facilitate integration of DER's." AOBA stated that "Pepco should be required to provide an annual report to the Commission, the District of Columbia government and the District of Columbia Council on Pepco's efforts to facilitate customers' utilization of DER alternatives."

B. DCCA supports this recommendation with clarification: In order to remove potential for misinterpretation, change wording of "give oversight to Pepco to continue to improve its SGIP…" to "oversee the continued improvement by Pepco in implementing the SGIP …"

C. DCSUN conditionally supports this recommendation and believes that this recommendation should also include interconnection of Community Solar projects because improvement in that process is critical. Also, this recommendation should be aligned with Recommendation 5.2.7.

D. DOEE conditionally supports, suggesting that "these rules should not duplicate RM402017-01. DOEE suggested three focuses of this recommendation: 1) need rules for islanding various systems and interconnection of storage, 2) denied application for Levels 2 through 4 renewable systems should trigger the NWA process for hosting capacity constraints and 3) transparency in the pricing process and set timelines.

E. EEI supports this recommendation with the caveat that the costs of improvements in the interconnection process — which can be substantial depending on the type of improvement (e.g., time to interconnection) — must be carefully considered to ensure that standard customers (residential and C&I without resources to interconnect) do not shoulder the cost burden.

F. General MicroGrids supports this recommendation.

G. Grid2.0/DCCUB/Sierra Club support this recommendation, however, DCPSC should "provide" oversight, rather than "give" it. "Provide" more clearly

communicates the intent of this recommendation, whereas “give” can be interpreted to turn over the function to Pepco.

H. GRID Alternatives MidAtlantic / NCS supports the goal of this recommendation.

I. OPC supports this recommendation.

J. Pepco supports this recommendation. Pepco is committed to continued improvement in the interconnection process but feels it should be noted that process improvement cannot be judged solely on the basis of the rate of DER interconnection.

K. Sunrun supports this recommendation.

L. WGL Energy supports this recommendation.

5.1.5 RECOMMENDATION – DCPSC TO REVISE LANGUAGE IN MEDSIS VISION STATEMENT

5.1.5.1 Recommendation

DCPSC should update the language in the DCPSC Elaboration of Affordable in Section A.4 of the MEDSIS Vision Statement to reflect both the electric and natural gas utilities.

A. Proposed Change 1: The Commission recognizes that rapid technological change in the electric and natural gas industries increases the danger of “stranded assets” – capital investments that turn out to be unneeded.

B. Proposed Change 2: The electric and natural gas utilities must also undertake holistic planning approaches that fully examine technological options that can be deployed at a pace and scale that can meet policy objectives and customer expectations for continued system reliability and affordability.

C. Proposed Change 3: In the long-term, the Commission expects that, under fair interconnection procedures, DER’s will be able to stand on their own in the competitive marketplace without subsidies from electric and natural gas distribution ratepayers. Therefore, benefits and costs of any proposals to use electric and natural gas distribution rates to compensate new DERs must be weighed carefully.

5.1.5.2 Background

Based on stakeholder discussions during the October and November 2018 WG1 meetings, WG1 addressed the need to change existing language in the MEDSIS Vision Statement.

5.1.5.3 Stakeholder Positions

A. AOBA supports this recommendation.

B. DCCA supports this recommendation with the following changes:

a. Add to the recommended addition ("and natural gas") the phrase "and District clean energy legislation and goals".

b. The recommendation was to add at the end after "customer expectation" the qualifier "for continued system reliability and affordability." To add further clarity, DCCA proposes to replace in that same sentence the phrase "meet policy objectives" (whose policy objectives?) with "conform with District clean energy legislation".

c. DCCA supports the original MEDSIS Vision Statement wording, from which the recommendation deletes the phrase at the end, "and considered in connection with the benefits and efficiencies such DER may bring to the distribution system." The original wording maintains the balance of the statement – the sense of it that eventually DERs will be able to stand on their own but that their net benefits (which have justified subsidies) must be evaluated on an ongoing basis to determine when subsidies should end.

C. DCSEU supports this recommendation.

D. DCSUN supports the overall goal of this recommendation however objects to proposed change three. DERs have multiple values in the distribution system beyond being able to "stand on their own" in the market. Therefore, due to these benefits to the system which all ratepayers enjoy, it may make a lot of sense for rate-payers to subsidize DERs in some fashion because of benefits they bring (zero carbon, lower congestion, lower transmission costs, load shifting and load management). DERs provide grid benefits that are not currently reflected in retail electric and gas rates. It's not a ratepayer "subsidy"—it is a quantification of the system, environmental, and social benefits of DER. Even if DERs are cost-competitive in the marketplace, they will continue to provide those values, and those values should be reflected in rates. DCSUN supports proposed change 1 and abstains from stating a position on proposed change 2.

E. DOEE supports this recommendation and suggests the original statement be revised to ensure it does not imply that curbing rapid technological change may be necessary in order to reduce stranded assets. DOEE suggested the language explicitly states that utilities "must undertake holistic planning in order to minimize the risk of stranded assets." DOEE does not support the original language included in the MEDSIS Vision Statement regarding DER competition. DOEE stated "Although DER should be market competitive, DC government still may need to incentivize fuel switching in order to counteract the current low price of natural gas to support its climate change goals. "Weighing carefully" the compensation of new DERs could end up as a soft recommendation against potential fuel switching from natural gas. For DER competing against traditional supply of electricity, provided that the locational value of DER is available, DER should be able to stand on its own."

F. EEI supports this recommendation with a language change from section A: The term “stranded assets” should be removed, as it is being used incorrectly in this context.

G. General MicroGrids supports this Recommendation, but would add to section C, at the end, “to compensate DERs must be weighed carefully, taking into account the value of the benefits and services that such resources can provide, including applying consistent, verifiable methodologies for determining such value.”

H. Grid2.0/DCCUB/Sierra Club conditionally supports this recommendation, suggesting an additional statement onto Section C: “In the long-term, the Commission expects that, under fair interconnection procedures, DER’s will be able to stand on their own in the competitive marketplace without subsidies from electric and natural gas distribution ratepayers. Therefore, benefits and costs of any proposals to use electric and natural gas distribution rates to compensate new DERs must be weighed carefully using a benefit-cost framework that incorporates both externalization of costs to environment and society, as well as incorporation of benefits accruing to the same. Grid2.0/DCCUB/Sierra Club also suggests that Section A include the danger of “stranded emissions” in violation of the Clean Energy DC Omnibus Act of 2018 as the District transitions to 100% renewable electricity by 2032.

I. GRID Alternatives MidAtlantic partially supports this recommendation. Generally, market-based solutions tend to leave out vulnerable and historically underserved populations. GRID supports targeted incentives and subsidies to ensure that DERs are deployed to benefit underserved populations, especially low-income customers. Accordingly, GRID supports DOEE’s comments on the draft recommendation that “DC government still may need to incentivize fuel switching in order to counteract the low price of natural gas to support its climate change goals.” GRID also supports DCSUN’s statement that “DERs have multiple values in the distribution system beyond being able to ‘stand on their own’ in the market.”

J. NCS supports DOEE’s comments on the draft recommendation that “DC government still may need to incentivize fuel switching in order to counteract the low price of natural gas to support its climate change goals.” NCS also supports DCSUN’s statement that “DERs have multiple values in the distribution system beyond being able to ‘stand on their own’ in the market.”

K. OPC supports this recommendation.

L. Pepco supports this recommendation.

M. Sunrun opposes this recommendation. Sunrun disputes the assumption in Proposed Change #3 that electric and natural gas distribution ratepayers subsidize DERs.

N. WGL Energy supports this recommendation.

5.1.6 RECOMMENDATION – DCPSC TO DEVELOP PUBLICLY AVAILABLE SYSTEM-LEVEL DATA WEBPAGE

5.1.6.1 Recommendation

DCPSC should consider hosting and maintaining an online bibliography that allows access to publicly available system-level data in the District. This webpage should contain links to mapping, interconnection queues, and other public documents where system-level data in the District resides. Pepco should continue to be responsible for updating and maintaining the source of the data and DCPSC should ensure that the data is properly linked and easily viewable and accessible via the website. Any costs associated with developing the system-level data online bibliography on the DCPSC host site should come out of the MEDSIS Pilot Fund. Any non-public, locationally-specific system-level data can, when appropriate, could be made available through a Pepco-implemented secured web portal and NDA process outlined in Recommendation 5.1.8.

5.1.6.2 Background

During the January 2019 WG1 meeting, stakeholders developed Table 5.2 (illustrated below) which outlines the different types of system-level data that are currently available in the District. The table includes data type, frequency and granularity. It also explains where and how the data is currently available. A webpage that hosts this type of data will facilitate the accessibility and availability of system-level data in the District.

Data Type	Frequency	Granularity	Availability
Capital Investment Plan – General Overview	Annual, 10 year forecast period	System	Current; Public (Pepco's Annual Consolidated Report)
Load forecast	Annual, 10 year forecast period	Substation	Current; Public (Pepco's Annual Consolidated Report)
Reliability statistics (SAIFI, CAIDI)	Annual (ACR)	Feeder level	Current; Public (Pepco's Annual Consolidated Report)
Planned resiliency/ reliability projects	Annual	Varies by project	Current; Public (Pepco's ACR and Rate Case Construction Report)
Load data	Annual (ACR)	Feeder (Historic)	NDA
Hosting Capacity	Quarterly	Feeder level	Hosting Capacity Map; Website
Beneficial Location	N/A	N/A	Not Available
Existing DER Capacity	Monthly	Feeder level	Heat Map; Website

Table 5. 2 – System-Level Data Available in the District (as of January 2019)

Stakeholders also developed Table 5.2 that includes the current circuit related information in the District.

Data Type	Frequency	Granularity	Availability
Circuit Capacity/ Design Criteria	Static (updated as projects are implemented)	Feeder level	Critical Energy Infrastructure Information (CEII); Secure access required.
Physical Attributes	Static (updated as projects are implemented)	Node level	Critical Energy Infrastructure Information (CEII); Secure access required.
Protective devices	Static (updated as projects are implemented)	Feeder level	Critical Energy Infrastructure Information (CEII); Secure access required.
Voltage profile	Static (updated as projects are implemented and with changes in load information)	Feeder level	Critical Energy Infrastructure Information (CEII); Secure access required.
Circuit impedance models	Static (updated as projects are implemented)	Feeder level	Critical Energy Infrastructure Information (CEII); Secure access required.

Table 5. 3 – Circuit Data Available in the District (as of January 2019)

DCCUB, DOEE, DCCA, EEI, IMT, Grid2.0, DCSEU, OPC-DC and Pepco provided input via an online survey and identified the available data in the District. The following conclusions can be made from the survey results and from in-person discussions that followed:

- Pepco is required to update its hosting capacity maps quarterly, however, Pepco mentioned that they run studies every month and when available, incorporate new hosting capacity values into the map in a reasonable time.
- There was general agreement that all of the currently available data illustrated in Table 5.2 should be easily accessible via an online webpage.
- There was debate amongst the stakeholders around the locational value of DERs. One discussion point made was that locational value studies can be deeply subjective resulting in widely varying ascribed values, and may merit additional discussion and balanced analysis in the District.
- Another point was around the potential anti-competitiveness of releasing locational value. Pepco stated that the competitive market would set the locational value of DER during the open bidding NWA process at locationally constrained areas of the distribution system - refer to Recommendation 5.2.3 for more discussion on the NWA planning process.
- Grid2.0 and DOEE stated that Pepco may not be the appropriate party for determining value of DER and proposed the DCPSC consider a value of DER study – refer to Recommendation 5.3.2 for more discussion on a Value of DER Study.

5.1.6.3 Stakeholder Positions

A. CRDC conditionally supports this recommendation, but believes that "an independent party should be responsible for making system-level data accessible but would recommend this be consolidated under an independent market operator to provide one centralized, accessible location for all energy data."

B. DCCA supports this recommendation with the following changes:

C. DCSEU supports this recommendation.

D. DOEE conditionally supports this recommendation, stating it suggests that Recommendation 5.1.6 through 5.1.8 be consolidated.

E. EEI supports this recommendation with the caveat that the webpage for the bibliography should be distinct and separate from the secured web portal mentioned in the latter portion of the recommendation. EEI believes the recommendation would be strengthened by such a clarification.

F. General MicroGrids supports this recommendation.

G. Grid2.0/DCCUB/Sierra Club supports this recommendation.

H. OPC supports this recommendation and would like "resource portal" be used instead of "bibliography."

I. Pepco supports this recommendation and believes it should be funded out of the MEDSIS pilot funds.

J. Sunrun supports this recommendation.

K. WGL Energy supports this recommendation.

   a. Gas should as a matter of principle be added to the system-level data, with Washington Gas being responsible for maintaining gas-related webpage data.

   b. In order to clarify that the MEDSIS Pilot Fund would not finance ongoing additions to the online bibliography, in sentence 4 the term "developing" should be changed to "the establishment of."

5.1.7 RECOMMENDATION – DCPSC TO DIRECT PEPCO TO UPDATE HOSTING CAPACITY MAPS ON A MONTHLY BASIS

5.1.7.1 Recommendation

DCPSC should direct Pepco to update hosting capacity maps on a monthly basis. The frequency should be reviewed annually by the DCPSC.

5.1.7.2 Background

During the January 2019 WG2 meeting, stakeholders discussed Pepco's requirement for updating hosting capacity maps on a quarterly basis in the District. Pepco stated

that each month Pepco identifies any circuit needing update and incorporates the new values into the maps. During the March 2019 WG2 meeting, several stakeholders requested that the performance data determining hosting capacity of a particular line specific to a locational constraint identified in the NWA process referenced in Recommendation 5.2.3 should be made available through the appropriate NDA and secure portal referenced in Recommendation 5.1.8.

5.1.7.3 Stakeholder Positions

A. DCCA supports this recommendation.

B. DCSEU supports this recommendation.

C. DCSUN generally supports this recommendation, stating "that this recommendation needs significant amendment. While Pepco should update and make their current hosting capacity assessments easily available and updated regularly, what is more important over the long term is to do a deeper dive into the methodology for assessing capacity. Pepco's methodology for assessing hosting capacity needs to be examined, refined and transparent. As the District gets more and more solar, this process needs to be more rigorous, robust and defensible and ways to address hosting capacity limits must be developed in advance of shut downs".

D. DOEE conditionally supports this recommendation. DOEE suggested that the frequency of updates occur on a monthly basis at a minimum or more frequently as Pepco updates the maps internally. DOEE stated that "this recommendation should provide that the system performance data determining the hosting capacity of a particular line will be made available in accordance with the NWA planning process." DOEE also recommends that the "information available on Pepco's hosting capacity webpage be converted into a usable format for download (either as a .shp or .csv file)." More importantly, DOEE has stated throughout the working group meetings that one of the key issues is reviewing Pepco's criteria for identifying hosting capacity constraints. Neither this working group nor the NWA working group, to which the Commission delegated these issues to be resolved, addressed this issue in any meaningful way. Pepco suggested that this issue can be addressed in the new NWA planning process, but no information of any kind was made available to the working groups that explained the specific engineering rationale for using Pepco's current criteria for determining the hosting capacity constraints, which has been criticized in the International Renewable Energy Council report submitted in FC 1050, for being overly restrictive. Nor did the group discuss the type of smart grid investments needed to expand the hosting capacity. At the last meeting, fearing that the working group would have no meaningful recommendation on hosting capacity, DOEE proposed a pilot project using a solar and battery microgrid to expand the hosting capacity of a radial feeder line. DOEE regrets that the working group did not make sufficient progress on this key issue for ensuring the viability of the grid to support the Solar for All goal.

E. EEI supports this recommendation.

F. General MicroGrids supports this recommendation.

G. Grid2.0/DCCUB/Sierra Club supports this recommendation.

H. GRID Alternatives Mid-Atlantic generally supports this recommendation, stating that the DCPSC should also consider the substantive criteria for identifying hosting capacity constraints.

I. NCS supports this recommendation.

J. OPC supports this recommendation.

K. Pepco supports this recommendation.

L. Sunrun supports this recommendation.

M. WGL Energy supports this recommendation.

5.1.8 RECOMMENDATION - DCPSC TO DIRECT PEPCO TO CREATE A SECURE WEB PORTAL FOR RFP RESPONSES AND PROGRAMMATIC DATA REQUESTS

5.1.8.1 Recommendation

DCPSC should direct Pepco to create a secured web portal and NDA process to enable system-level data flow between third parties and utility for RFP responses and programmatic data requests by government agencies. The secured web portal and NDA process could facilitate the sharing of non-public, locationally-specific system-level data between the utility and third parties responding to RFPs and with government agencies developing DER programs. The costs associated with developing and implementing a secured web portal and NDA process should be subject to appropriate rate recovery. DCPSC should also direct Pepco to ensure that the third parties and government agencies that receive data directly from the secured web portal are held to the same levels of rigor in their policies and practices to address cybersecurity threats.

5.1.8.2 Background

During the October and November 2018 WG1 meetings, stakeholders discussed the need for developing appropriate protocols for sharing and downloading system-level data amongst market participants.

During the January 2019 WG1 meeting, MKACyber shared several data access and data sharing best practices. MKACyber presented several illustrative best practices that the stakeholders gravitated towards. They stressed the importance of understanding the wide range of adversaries to the energy delivery system—some want to harm the country, some want to harm specific companies, and some want to harm particular customers. MKACyber recommended that there should be a proper vetting and screening process exercised between all parties who begin to work with each other.

For example, non-disclosure agreements (NDAs) and background checks during the bidding process. MKACyber also recommended that those involved in data transfer should employ a utility-managed secure portal or encrypted vehicle for accessing information. WG1 agreed that if a high security threshold were to be established in the District, then stakeholders would be more comfortable sharing information with those with a legitimate need to access it.

In addition to best practices discussed in the WG1 meetings, stakeholders also shared system-level data requests and intended uses of such data. This exercise was intended to understand stakeholder interest in system-level data, and how it would or would not be useful in the stated use context. Stakeholders agreed that system-level data that is currently publicly available should be made easily accessible through an open system-data webpage as described in Recommendation 5.1.6. System-level data that is considered critical infrastructure information (CII) pertains to feeders serving federal facilities. Data containing personally identifiable information (PII) is held to standards governed by NERC and D.C. Law, and must not be shared publicly.

NERC Critical Infrastructure Protection (CIP) governs critical infrastructure standards at the transmission levels, which all utilities must comply.

D.C. Law[11] defines "Critical Infrastructure information" as information that is not customarily in the public domain that is related to the security of critical infrastructure of companies under the domain of the DCPSC.

During the October and November 2018 WG1 meetings, stakeholders discussed the DCPSC MEDSIS Guiding Principles and proposed adding additional measurable objectives or recommendations to each existing principle. Grid2.0, USGBC, Pepco, DOEE and EEI all provided written comments on each of the principles and WG1 developed several recommendations intended to further the MEDSIS Vision Statement. Discussion around the USGBC's PEER Rating System and testimonies from third-party energy and DER providers in the Customer Impact Working Group identified the importance of ensuring that utilities and third-parties that receive system-level data directly from new utility data portals apply the same level of rigor in their policies and practices to address cybersecurity threats. That may include, but is not limited to data anonymization and aggregation, data access, data encryption, data security audits, automatic data breach detection, threat and vulnerability assessments and data security awareness training.

In order to balance the utility obligation to protect customer privacy and system security with the potential benefits to be gained by enabling stakeholders to bring forward proposals to advance the District's ambitious DER goals, the working group addressed a need for Pepco to share system-level data with third parties who are responding to NWA request for proposals (RFPs) and with government agencies developing DER programs.

[11] Code of the District of Columbia § 2–539, https://code.dccouncil.us/dc/council/code/sections/2-539.html

5.1.8.3 Stakeholder Positions

A. Arcadia Power supports this recommendation. Third parties wishing to provide NWAs and other grid services will benefit from access to system data. The web portal proposed in this recommendation will help to ensure that Pepco's RFPs receive cost-effective responses.

B. CRDC conditionally supports this recommendation, suggesting that "an independent market operator should be responsible for making quality, regular interval system-level data accessible to 3rd parties."

C. DCCA supports this recommendation. This recommendation is specific to Pepco. The Commission may wish to direct Washington Gas to create a corresponding web portal for RFP responses and programmatic data requests concerning gas.

D. DCSEU supports the recommendation and "welcomes the opportunity to work with existing systems and stakeholders to determine the most cost-efficient and secure means to facilitate proper exchange, access and quality assurance for such data." DCSEU stated that having access to "secure and up to date information on existing, planned and potential energy efficiency is another critical set of system level data. Data security and protection of sensitive customer data will need to be assured as this information is shared."

E. DCSUN abstains from stating a position.

F. DOEE supports this recommendation, but suggests that the DCPSC should not just enable but rather facilitate the accessibility of system-level data in the District. DOEE specifically stated that the "formula used for anonymization and aggregation must yield results that are useful to third party energy service providers and government planners." Access to data at a sufficient level of granularity will be critical for implementing plans that bring the District into compliance with the Clean Energy goals that have been set.

G. EEI supports this recommendation.

H. General MicroGrids supports this recommendation.

I. Grid2.0/DCCUB/Sierra Club supports this recommendation.

J. OPC supports this recommendation conditionally. PSC and other DC government agencies should not be made to pay to access data. Third parties should however pay to access said data. Remove rate recovery should read appropriate costs.

K. Pepco supports this recommendation.

L. Sunrun supports this recommendation.

M. WGL Energy supports Recommendation 5.1.8.1 on the condition that third parties will provide cybersecurity protections commensurate with the level of security needed for the type of data they obtain.

5.1.9 RECOMMENDATION - APPLY MEDSIS GUIDING PRINCIPLE METRICS FOR GENERAL DCPSC DECISION MAKING

5.1.9.1 Recommendation

DCPSC should consider using the metrics for the 7 MEDSIS Guiding Principles as discussed in Recommendation 5.6.2 more broadly to provide guidance for decision making and not just as a screening tool for pilot projects.

5.1.9.2 Background

During the October and November 2018 DIAA Working Group meetings, the working group discussed the Commission's MEDSIS Guiding Principles and proposed adding additional measurable objectives or recommendations to each existing principle. Grid2.0, USGBC, Pepco, DOEE and EEI all provided written comments on each of the principles and the working group developed several recommendations intended to further the MEDSIS vision. The inputs around measurable objectives were used to develop the "Pilot Project Screening and Scoring Template" in the Pilot Project Working Group (WG6). For more information around the "Pilot Project Screening and Scoring Template," see Recommendation 5.6.2. Several stakeholders agreed that these metrics, objectives and processes to help implement MEDSIS guiding principles could be submitted to the DCPSC for general considerations, not just as a screening tool for pilot projects.

5.1.9.3 Stakeholder Positions

A. DCCA supports this recommendation.
B. DCSUN abstains from stating a position.
C. DOEE supports this recommendation, reiterating "the metrics, objectives and process to help implement MEDSIS guiding principles should also be submitted to PSC as a stand-alone item for PSC review, not just as a screening tool for the pilot projects or for mapping PIMs."
D. EEI supports this recommendation but also wishes to highlight the words "should consider" within this recommendation, as EEI believes that not all Commission decisions should be subjected to metrics developed for MEDSIS; the Commission must have the latitude to determine which metrics to apply to which proceedings.
E. General MicroGrids supports this recommendation.
F. Grid2.0/DCCUB/Sierra Club supports this recommendation
G. GRID Alternatives MidAtlantic supports this recommendation.
H. NCS supports this recommendation.
I. OPC supports this recommendation. This list should be flexible to be inclusive of other tools and metrics.

J. Pepco supports this recommendation with the following qualification: While Pepco agrees that the MEDSIS guiding principles – sustainable, well-planned, safe/reliable, secure, affordable, interactive and non-discriminatory – should be loadstones that guide the Commission's consideration of a variety of electric and gas system decisions, it should be noted that there is dynamic tension between a number of these principles. It should be further noted that the Commission must use its discretion to determine which metrics associated with these principles to apply to specific proceedings and how to balance the application of these metrics with other precedents and factors that have historically been applied to aid Commission decisions.

K. Sunrun supports this recommendation.

5.1.10 LEARNING - BALANCE SYSTEM-LEVEL DATA AVAILABILITY WITH SECURITY AND AFFORDABILITY

5.1.10.1 Background

Several members of WG1 filed system-level data requests with an accompanied intended use. DCCA, Sunrun, DOEE and CRDC submitted stakeholder system-level data requests and intended use cases. The stakeholder requesting the data, type of data, and the data's intended uses are provided below in Table 5.4.

Stakeholder	Data Type	Uses
DCCA	By feeder and circuit, what is the hosting capacity? What is the average load as a percent of hosting capacity? What is the peak load as a percent of hosting capacity?	DER developers and proponents of non-wires alternatives need this for planning and proposals.
DCCA	By feeder and circuit, what is the existing amount of distributed energy resource as a percent of hosting capacity?	Planners, regulators and DER developers need this.
DCCA	By feeder and circuit, what is the hourly profile of DER supply and total power load, by month?	DER developers can use this to assess opportunities for new investment.
DCCA	What is the carbon intensity of electricity provided by PJM to the District, by time of day, weekday/weekend, and month or season?	Planners and regulators can use this to reduce peak load and to assess the carbon emissions impact of dynamic pricing options.
DCCA	What is the natural gas leakage rate, by pipeline and other distribution infrastructure?	Regulators need this to assess the carbon emissions impact of leakage, to prioritize pipe replacement and to assessing Washington Gas'

Stakeholder	Data Type	Uses
		performance.
Sunrun	Network demand data	There is typically no historic demand data available from utilities, which makes it difficult to assess load characteristics and congestion levels. Historic data should be provided at 1h temporal resolution for at least 1 year by substation load area, and ideally by individual feeders
Sunrun	Forecast demand growth	It is recommended that utilities provide, in addition to historic data, forecasts of future network loading.
Sunrun	Customer type	It is important for grid service providers to know the proportion of industrial, commercial, residential, and agricultural customers as the service they provide may depend on the quantity of residential customers.
Sunrun	Outage data	It is important to understand how outages and load transfers from adjacent circuits affect the loading of particular assets. Utilities should provide an overview about the frequency of potential outages, contingency arrangements and load transfers to adjacent tie circuits.
Sunrun	Network value	Knowing the potential cost of distribution capacity upgrades allows the deferral value to a utility to be estimated. In the absence of nodal pricing, utilities should ideally provide outline cost estimates of the required capacity upgrade if an NWA solution were not implemented.
Sunrun	Network sizing	It is important to understand the rated capacity of transformers and circuits

Stakeholder	Data Type	Uses
		in order to assess level of congestion and therefore the deferral value of an NWA solution to a utility. The rated capacity of transformers and circuits should be provided in MVA.
Sunrun	Geographic awareness	Utilities should provide a geographic information system with both networks and mapping of customers to those networks.
Sunrun	Voltage and power quality issues	Grid service providers can potentially alleviate voltage and power quality issues and so an overview of the existing issues is desirable.
Sunrun	Downloadable data	Any datasets made available should be in a format that can be easily downloaded and analyzed by grid service providers.
DOEE	Pepco DC's monthly peak demand by customer class	To help reduce distribution peak demand and associated costs; Allows targeted DER deployment (EE, DR, storage, PV should be incentivized more in stressed substation service areas and target customer class driving up demand)
DOEE	Hourly load profiles for each substation service area and customer class in each substation service area	To help reduce distribution peak demand and associated costs; Allows targeted DER deployment (EE, DR, storage, PV should be incentivized more in stressed substation service areas and target customer class driving up demand)
DOEE	Pepco DC's monthly contribution to the PJM coincident peak	To help reduce transmission peak demand and associated costs
DOEE	Peak hour and capacity utilized during peak hour per month (i.e. top 6 hours for each of top 5 days of each month) for each substation and major feeder group relative to the nominal capacity rating	Allows targeted DER deployment (EE, DR, storage, PV should be incentivized more in stressed substation service areas) to reduce peak growth experienced in the customer class

Stakeholder	Data Type	Uses
DOEE	Anonymized and aggregated load and demand data by circuit and transformer, and the capacity limits of these components	Allows targeted DER deployment (EE, DR, storage, PV should be incentivized more in stressed substation service areas) to reduce peak growth experienced in the customer class
DOEE	Fall and Spring load profiles of lines during the hours that solar generation is active (e.g., 11 AM to 4 PM) and average usage is low (e.g., Sunday)	Informs storage and solar developers of potential area limitations for solar PV and storage
DOEE	Voltage profile information of feeders and transformers; information of locations of reclosers, sectionalizers that minimize the duration and magnitude of a fault	Informs DER providers of potential optimal locations for adding DER
DOEE	DER Integration Software/Advanced Distribution Management System	DER developers and proponents of non-wires alternatives need this for planning and proposals.
CRDC	Transparency around the calculation of hosting capacity and how it's currently used to facilitate interconnection.	In order to ensure that adequate standards, practices and methodologies are used to calculate hosting capacity, CRDC requests that an outline of the hosting capacity calculation process by made public. Furthermore, it is unclear when the hosting capacity map is updated.
CRDC	Hosting capacity for technologies beyond PV, including storage, CHP plants, and PV with smarter inverters.	Hosting capacity must be available for various technologies and inclusive of benefits of voltage-smoothing technologies such as smart inverters.
CRDC	The interconnection queue for all DER projects seeking interconnection	Currently, the interconnection process for DERs is opaque when it comes to costs and time-to approval. These uncertainties can lead to higher project costs and high rates of contract cancellation.
CRDC	The costs associated with each approved DER interconnection	Currently, the interconnection process for DERs is opaque when it comes to costs and time-to approval. These uncertainties can

Stakeholder	Data Type	Uses
		lead to higher project costs and high rates of contract cancellation.
CRDC	DER Services Performance (called-on DER)	
CRDC	Locational Value	Sunrun pointed out the importance of Network Value in assessing a NWA scenario. The following data will complement the Sunrun's call for valuing an upgrade

Table 5. 4 – Stakeholder System-Level Data Requests and Intended Uses

Pepco provided a response to each of the data requests answering if the data was already supplied, unavailable for legal/proprietary/technical reasons, or if it could be made conditionally available. Table 5.5 below maps out where system-level data lives in the District and how it may or may not be made available.

Data Type	Already Supplied	Conditionally Available	Unavailable
Forecast Demand Growth	X; ACR[12]		
Customer Type	X; ACR		
Out Data	X		
Downloadable Data	X[13]; GreenButton Download My Data		
Pepco Contribution to PJM Coincident Peak	X; ACR		
DER Integration Software / ADMS	X; ACR[14]		
Hosting Capacity by Feeder / Circuit	X; Hosting Capacity Maps		
Avg. Load as a % of Hosting Capacity by Feeder / Circuit	X; Hosting Capacity and Solar Heat Maps		

[12] Pepco is currently streamlining the ACR with DCPSC Staff input

[13] WG1 identified a problem with downloading and viewing data in accessible format. Data that is available is raw.

[14] Consolidated within the Construction Reports

Data Type	Already Supplied	Conditionally Available	Unavailable
DER as a % of Hosting Capacity	X; Hosting Capacity and Solar Heat Maps		
Interconnection Queue and Associated Costs for DER Projects	X; Interconnection Applicants		
DER Services Performance (called-on DER)			X; Should be collected on all future NWA projects
Locational and Network Value			X; Potential anti-competitive practices
Carbon Intensity of Electricity Provided by PJM			X; Requires more attention from PJM
Hourly Load Profiles for Each Substation Service Area		X; Secure Web-Portal and NDA	
Customer Class in Each Substation		X; Requires additional analysis with cost impact on ratepayer	
Fall/Spring Load Profiles During Active Hours of Solar Generation		X; Requires additional analysis with cost impact on ratepayer	
Hourly Profile of DER Supply and Power Load per Month by Feeder / Circuit		X; Locationally-specific data through Secure Web-Portal and NDA	
Voltage and Power Quality Issues			X; Individual customer data cannot be shared
Peak Hour and Capacity Utilized During Peak Hour per Month for Each Substation and Major Feeder Groups		X; Locationally-specific data through Secure Web-Portal and NDA	
Network Demand Data		X; Must be Aggregated to 5+	

Data Type	Already Supplied	Conditionally Available	Unavailable
		Customers and Locationally-specific data through Secure Web-Portal and NDA	
Network Sizing		X; Locationally-specific data through Secure Web-Portal and NDA	
Anonymized and Aggregated Load and Demand Data by Circuit / Transformer		X; Locationally-specific data through Secure Web-Portal and NDA	
Geographic Awareness		X; Locationally-specific data through Secure Web-Portal and NDA	
Voltage Profile Information of Feeders, Transformers, Reclosers and Sectionalizers		X; Locationally-specific data through Secure Web-Portal and NDA	

Table 5. 5 – Mapping out System-Level Data Availability in the District

Credit: MEDSIS WG1: Data Information Access and Alignment

In addition to the system-level data discussion, Pepco shared with WG2 how it calculates hosting capacity and provided details around the stochastic methodology.

5.1.10.2 Conclusion

Based on several discussions around system-level data and the availability, cost implications and security implications, WG2 developed several learnings and recommendations. During stakeholder discussion, it was determined that Pepco is required to update its hosting capacity maps quarterly, however Pepco identifies any circuit needing updates once each month after which the study is run and new values are provided and incorporated into the map in a reasonable time period. Given that these values are provided and incorporated each month, Recommendation 5.1.7 ensures that Pepco updates its hosting capacity maps monthly. The locational value of

DERs is something that came up in discussions across multiple MEDSIS working groups. WG1 learned from the New York Public Service Commission (NYPSC) that quantifying locational value of DERs is a work in progress and difficult to achieve. Stakeholders in the Rate Design Working Group have recommended that the DCPSC consider conducting a study to assess both the locational value of DERs and the value of the grid, which Recommendation 5.3.2 addresses. Other stakeholders in the Rate Design Working Group oppose this suggestion due to the potential high study cost, subjective nature of studies evaluating externalities, and likelihood that it will result in contentious proceedings.

Table 5.5 above includes several types of sensitive data that should only be shared in the context of an RFP response or programmatic inquiry, and could only be made available through a secured web portal with the execution of a non-disclosure agreement (NDA). Recommendation 5.1.8 recommends Pepco develop a secure web-portal and NDA process to share this type of sensitive information in this RFP response or programmatic inquiry context. As proposed in Recommendation 5.2.3, Pepco will submit an annual Locational Constraints Report that will present areas of system capacity constraint that could be subject to NWA consideration. Sensitive and locationally-specific data can be made available to third party RFP respondents in accordance with the NWA planning process through the secured web portal discussed in Recommendation 5.1.8 and 5.2.3. For government agencies, locationally-specific requests and responses could also be made available and shared through the secured web-portal and NDA process implemented by Pepco. Additionally, per Recommendation 5.2.3, Pepco will submit an annual Locational Constraints Report that presents areas of system capacity constraint that could be subject to NWA consideration. Table 5.4 lays out all system-level data that is currently publicly available in the District. The DCPSC should host all of the system-level data that is currently available to the public and requested by stakeholders as proposed in Recommendation 5.1.6.

5.1.10.3 Stakeholder Positions

A. DCCA supports this learning.
B. DCSUN abstains from stating a position.
C. DOEE supports this learning, suggesting that it also “mention that some of the sensitive system level data will be made available in accordance with the NWA planning process.” DOEE supports “Pepco’s recovery of reasonable costs associated with making more meaningful data available.”
D. Grid2.0/DCCUB/Sierra Club supports this learning – the data identified as useful to third parties in this learning should be made available under the terms of Recommendation 5.1.8.
E. Pepco acknowledges these learnings.
F. WGL Energy supports this learning.

5.2 Non-wires Alternatives to Grid Investments

5.2 Non-Wires Alternatives							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.2.1	DCPSC to Establish an NWA Definition		x				
5.2.2	DCPSC to Establish NWA Classification		x				
5.2.3	DCPSC Should Order a Stakeholder-Informed DSP and NWA Consideration Process	x	x	x	x		
5.2.4	DCPSC to Establish an Advanced Inverter Definition		x				
5.2.5	Learning: Stakeholder Input on DCPSC Rules Around Ownership of DERs		x		x	x	
5.2.6	Learning: Need for Demonstrating NWA Projects in the District	x	x		x	x	x
5.2.7	DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment	x	x	x			x

Table 5. 6 – WG2: NWA Recommendations and Learnings

5.2.1 RECOMMENDATION - DCPSC TO ESTABLISH AN NWA DEFINITION

5.2.1.1 Recommendation

DCPSC should establish the following NWA definition and add it to the list of MEDSIS definitions within FC1130.

Definition*: "Non-wires alternative (NWA)" is any action or strategy in the energy delivery system domain that uses non-traditional transmission and/or distribution solutions—such as distributed generation, energy storage, energy efficiency, demand response, and grid software and controls—with the intent to defer or replace the need for specific energy delivery system equipment investments. A NWA must meet energy delivery system needs and be more cost effective consistent with the guiding principles of MEDSIS; sustainable, well-planned, secure, affordable, and non-discriminatory.*

5.2.1.2 Background

During the October 2018 Non-Wires Alternative (NWA) to Grid Investments Working Group (WG2) meeting, stakeholders reached general agreement that WG2 needed to define NWA and establish a common terminology on how to classify NWAs. MEDSIS Consultants developed a strawman definition of an NWA based on existing published

industry definitions and stakeholder input from the NWA Basics Survey that they created and sent to the stakeholders. The definition of NWA was based on those published by Navigant, NYREV Connect and the U.S. Department of Energy (DOE). The definition also stems from input collected from the following MEDSIS NWA stakeholders via an online survey: ESA, Enbala Power Systems, WGL Energy Systems, ThinkEco, GRID2.0, PJM Interconnection, Oracle Utilities, Urban Ingenuity, Sunrun and Pepco.

During the November 2018 WG2 meeting, the stakeholders worked through the strawman definition as a group and came up with language that was consistent with the MEDSIS Vision. WG2 developed and adopted the final MEDSIS definition in the November 2018 meeting. The discussion of the definition evolved into a discussion and general agreement around identifying the different technologies and benefits of NWAs.

Stakeholders discussed the types of NWA projects that could occur in the District. The types of projects discussed included but are not limited to energy efficiency, demand response, solar PV, energy storage, microgrids, fuel cells, combined heat and power (CHP), conservation voltage optimization, grid software and controls, and thermal energy.

Stakeholders also discussed the potential benefits for strategically placed NWAs in the District. Stakeholders had varying views on the needs that NWA projects can meet. The benefits discussed included but are not limited to reducing distribution and transmission infrastructure constraints, providing reliable peak shaving services, alleviating thermal constraints on feeders, delaying or deferring construction of traditional grid investments, alleviating sub-transmission feeder constraints at a substation, alleviating transmission and distribution constraints on a feeder, increasing hosting capacity, increasing power factor, improving local power quality, increasing grid resiliency, minimizing greenhouse gas emissions and regional air pollution, and extending the life of aging infrastructure. It is important to note that not all stakeholders agreed with each of the above benefits of NWAs.

5.2.1.3 Stakeholder Positions

A. DCCA supports this recommendation with the following condition: Delete second sentence that says NWA must meet energy system needs and be cost-effective. Those criteria are part of the evaluation of any NWA. An NWA may be relatively poor at those criteria and be rejected as a poor alternative, but still be an NWA. Such evaluation criteria are not part of a definition; they are necessary but belong elsewhere.

B. DCSUN conditionally supports this recommendation. The use of ‘cost effective’ in the last line of the definition is vague and fails to incorporate the many different reasons to implement a non-wires solution including environmental benefit, community benefit, reliability, and security. Cost-effectiveness has to be determined pursuant to a comprehensive, well-developed benefit-cost framework that fully values NWA assets compared to traditional infrastructure assets, and

that takes a long-term, system-wide view of the cost of traditional resources (e.g., gas well to burner tip, methane emissions for gas assets, etc.). If a BCA framework is not developed in this way, we are concerned that the definition for NWAs may not capture the full benefits of distributed generation that may be included in an NWA. If this becomes the case, DCSUN recommends that the term be changed to "optimized" so that the line reads "A NWA must meet energy delivery system needs and optimize the guiding principles of MEDSIS; sustainable, well-planned, secure, affordable, and non-discriminatory."

C. DOEE opposes this recommendations as written and proposes the following revised definition: "a NWA may be able to either partially or fully offset the need for grid investment, and be scored on a BCA framework that takes into account statement proposed by SEPA: "a NWA must meet energy delivery system needs and be more cost effective consistent with the guiding principles of MEDSIS." DOEE believes that the current definition proposed by [the working group] is inadequate because it only speaks to lower cost and reliability needs. It does not speak to GHG, potential to become stranded, and environmental factors which, in DOEE's opinion, are essential features of a viable NWA. For example, it is possible that DOEE may prefer a solution consisting of a large solar farm + battery project delivered through a traditional distribution system rather than a highly GHG intensive, natural gas-fired CHP, even though that may qualify as a NWA under [the current] definition."

D. EEI supports the definition in this recommendation.

E. Fluence supports this recommendation and adds a note that "some of these [NWA] benefits will likely lead to more viable NWA projects than others" and [Fluence] "urges stakeholders to not be overly concerned if some benefits drive more projects than others." Fluence also stated that "NWA projects are typically most successful when focused on addressing a single primary benefit."

F. General MicroGrids supports this recommendation, but would add, "microgrids" to the list of examples provided.

G. Grid2.0/DCCUB/Sierra Club supports this recommendation, with revision: This is properly a "Learning," not a Recommendation.

H. GRID Alternatives MidAtlantic conditionally supports the recommendation to establish a definition, but prefers the revised definition and comments offered by DOEE [above].

I. GridWise Alliance supports this recommendation, cautioning "against creating a definition that might result in confusion from inconsistencies between speculative benefits and the scope of projects proposed in Recommendation 5.2.3."

J. NCS conditionally supports the recommendation, but prefers the revised definition and comments offered by DOEE [above]. NCS feels strongly that solar energy assets cannot be owned (ratebased) by the utility as that will

fundamentally compromise the SREC market that is established to drive growth in the DC solar market.

K. OPC supports this recommendation.

L. Pepco supports this recommendation with the qualification that Non-Pipe Alternatives should also be defined.

M. Sunrun supports this recommendation with modification. Sunrun supports DOEE's modification of this definition.

N. WGL Energy supports this recommendation with the condition that all definitions including this one are adopted by the DCPSC when the DCPSC adopts rules that use the applicable definition. This will ensure that affected parties and the DCPSC will have context for assessing its meaning.

5.2.2 RECOMMENDATION – DCPSC TO ESTABLISH NWA CLASSIFICATIONS

5.2.2.1 Recommendation

DCPSC should establish the following NWA classifications and use them when reviewing potential NWA projects in the District.

1) Method of Sourcing: The types of NWAs could vary by the method of sourcing these actions or strategies as a non-wires alternative to traditional grid investments.
    a) Procurement (e.g. RFI, RFP)
    b) Programs (e.g. Demand Response Programs, Energy Efficiency Programs, Investment Incentives, Customer Acquisition)
    c) Pricing (e.g. Rider Tariff, Dynamic Pricing, Locational Marginal Pricing of DER services, Alternative Dispatch Options)
    d) Combinations of the above.
2) Location of NWA on Energy Delivery System: The types of NWAs could vary by their location on the energy delivery system.
    a) Behind-the-meter: Private, public and utility ownership structures
    b) Front-of-the-meter: Private, public and utility ownership structures (e.g. substation sited storage owned and operated by a utility)
    c) Transmission-level, substation-level, distribution-level and/or secondary-level (TSDS)
3) Portion of Energy Delivery System: The types of NWAs could vary by whether they are deferring distribution or transmission equipment investments.
    a) Transmission

b) Distribution

4) Type of Energy Service Delivered: The types of NWAs could vary by whether the investment is being made to the electricity or natural gas delivery system.
   a) Natural Gas
   b) Electricity

5.2.2.2 Background

MEDSIS Consultants developed a strawman classification of NWAs based on existing industry classifications and stakeholder input. The proposed strawman for classifying NWAs included four characteristics to help identify the type of NWA projects and programs. During the November 2018 WG2 meeting, stakeholders reached general agreement on a list of the differing characteristics. A month later during the December 2018 WG2 meeting, SEPA presented three NWA case studies illustrating real-world applications for different classifications of NWAs deployed across the U.S.

5.2.2.3 Stakeholder Positions

A. DCCA supports this recommendation conditionally. DCCA believes that Method of Sourcing is not a helpful tool in classifying NWAs and, without a persuasive justification for its inclusion, should be removed. The subcategories (Procurement, Programs and Pricing) seem to have little practical application or are not specific to NWAs.

B. DCSEU supports this recommendation.

C. DOEE opposes the proposed framing of NWA categories in the Recommendation. The NWA categories would be useful to the Commission if they are based on the actual grid constraints they are trying to solve; however, these proposed categories are not designed that way, and DOEE is concerned that these categories are poorly designed that add little to no value for evaluating NWA projects. All NWA projects will need a pre-determined process for procurement, and the "pricing" should be based on a BCA methodology that captures climate and environmental externalities.

D. EEI supports this recommendation with the understanding that the classification list is likely not comprehensive and only reflects the thinking of the Working Group at a particular point in time. This classification should not be used as the basis for any regulation.

E. Fluence supports this recommendation.

F. General MicroGrids supports this recommendation.

G. Grid2.0/DCCUB/Sierra Club supports this recommendation, with revision: This is properly a “Learning,” not a Recommendation.

H. GridWise Alliance supports this recommendation.

I. NCS conditionally supports this recommendation, with the exception of section 2a. and 2b., which references utility ownership structures of behind-the-meter and front-of-the-meter DERs and we'd like to reiterate our concern regarding the utility ownership of solar energy assets in the District of Columbia.

J. OPC supports this recommendation, offering that the "first step should be to ask what type of problem are we trying to solve."

K. Pepco supports this recommendation.

L. Sunrun supports this recommendation with modification. Sunrun opposes utility ownership of BTM assets and proposes to delete this option in 2 (a), as it is inappropriate and would chill private sector investment and innovation. In addition, Sunrun does not think it is necessary to distinguish procurement from programs, as programs can be a subset of procurement.

5.2.3 RECOMMENDATION – DCPSC SHOULD ORDER STAKEHOLDER-INFORMED DISTRIBUTION SYSTEM PLANNING (DSP) AND NWA CONSIDERATION PROCESS

5.2.3.1 Recommendation

DCPSC should issue an order to direct Pepco to move forward with Feb. 19th process (shown in Figure 5.1) of the stakeholder-informed distribution system planning (DSP) and NWA consideration process (see Appendix A.6.2) with the understanding that the process will be iterative and evolving.

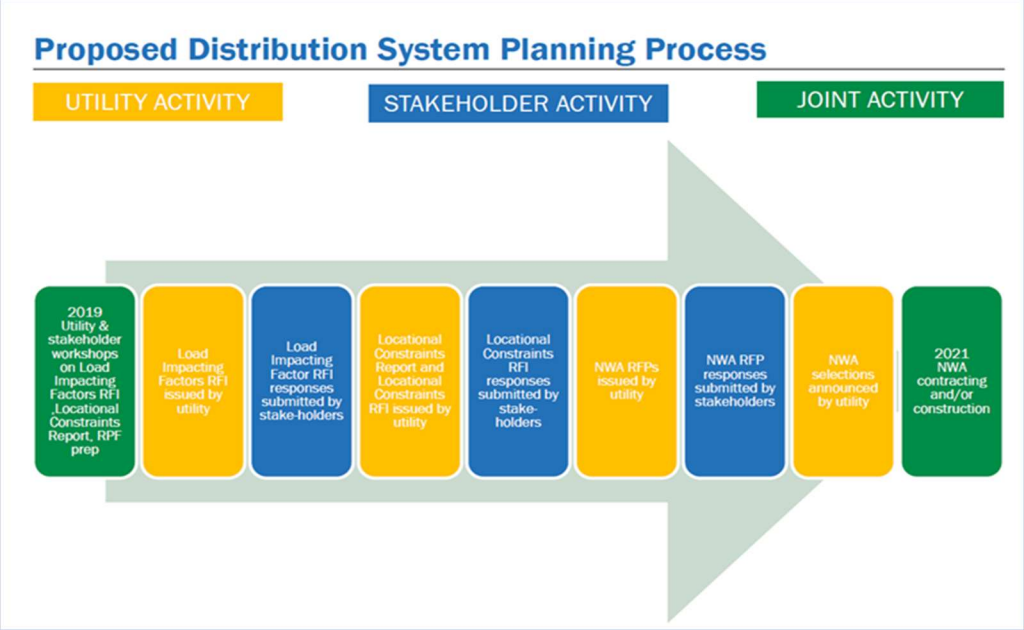

Figure 5. 1 – Proposed Distribution Planning and NWA Consideration Process (as of February 2019)

Credit: Pepco

5.2.3.2 Background

During the December 2018 NWA Working Group meeting (WG2), stakeholders learned from SEPA and Consolidated Edison, Inc. (ConEd) about distribution system planning processes and tools in other jurisdictions. SEPA discussed the drivers of enhanced distribution system planning processes in other states and highlighted key findings from each state. Avangrid and Con Ed presented their evolution of distribution system planning and how NWA projects fit within their planning process. WG2 developed Table 5.7 below summarizing distribution system planning frameworks in California, New Jersey, Rhode Island, Maryland, and New York.

	IDP / Grid Mod Plan Req'd	Hosting Capacity Analysis	Interconnection Req'd	DER in Load Forecast	NWA Consider	DER LNBA	DER Procure Strategies	Stakeholder Engagement	Storm Hardening and U/G	AMI and Customer Data
CA	Yes	Yes; CPUC req'd	Yes	Yes	Yes	Yes	Yes	DPAG for DSP, NWA and Forecasting	No	Yes; Green Button and Click-Through
NJ	No; 2019 EMP	No; Ongoing case addressing streamlining process	Yes	Yes	No	No	No	EMP WG and Meetings. None for DSP, NWA or Forecasting	No	Yes; Green Button Connect
RI	No	Yes; voluntarily	Yes	Yes	Yes	No	No; Proposed by Utility	EEMRC for NWA None for DSP or Forecasting	No	No; AMI Study April 2019
MD	No; Future DSP WG	Yes; voluntarily	Yes	Yes	No	No	No	PC44 Working Groups None for DSP, NWA or Forecasting	Yes	Yes; Green Button Download
NY	Yes; 2018 DSIP	Yes; NY PSC req'd	Yes	Yes	Yes	Yes	Yes	NYREV and CEAC for NWA	Yes	Yes

Table 5. 7 – Distribution System Planning Framework in Other Jurisdictions

Credit: January 2019 WG2: Non-Wires Alternatives Meeting

The MEDSIS Staff Report[15] calls for the need in D.C. to enhance distribution system planning in the District. Several stakeholders in D.C. have made comments encouraging Pepco to develop an open and transparent distribution planning process that involves stakeholder engagement. During the NWA December 2018 meeting, stakeholders identified drivers for enhanced distribution planning in the District. Figure 5.2 divides the drivers for enhanced planning into three categories:

1. Regulatory and/or policy
2. Public and/or community
3. Technical

[15] https://dcpsc.org/getmedia/6048d517-1d9d-4094-b0f4-384f19a11587/MEDSISStaffReport.aspx

Figure 5. 2 – Drivers for Enhanced Distribution Planning

Credit: MEDSIS WG2: Non-Wires Alternatives

The NWA Working Group examined the distribution system framework in other jurisdictions and identified the elements that are currently addressed in the District and those that are lacking. Other MEDSIS working groups also touched on these elements.

WG1 identified that there is limited bi-directional data flow between third parties and utilities in the District. There is an opportunity to increase data flow to facilitate DER market development, load forecasting, reliability and operational planning, and NWA consideration in distribution planning.

Recommendation 5.1.6 will aim to address the development of a system-level web portal to increase the accessibility of publicly available data for all stakeholders.

Recommendation 5.1.8 will aim to address bidirectional data flow between third-party market participants and utilities in an RFP and programmatic data request context.

Based on stakeholder discussion and guest speakers (see Appendix 2), the working group recognized that there is not a generally accepted methodology in the industry for evaluating the locational value of DERs. During this exercise, stakeholders identified limited coordination between Pepco, PJM, DCSEU, DOEE and real estate developers as it relates to load growth data and load forecasting. Additionally, the working group identified a lack of stakeholder engagement during the planning process. The working group determined that these issues needed to be addressed in the District.

During the January 2019 NWA meeting, Pepco shared a proposed distribution planning process that includes a stakeholder-informed process for collecting input from stakeholders on load forecasting and non-wires alternative considerations in constrained areas of the distribution system. Figures 5.3 and 5.4 below show the depiction of Pepco's initial NWA/DSP proposal from the current distribution system planning process.

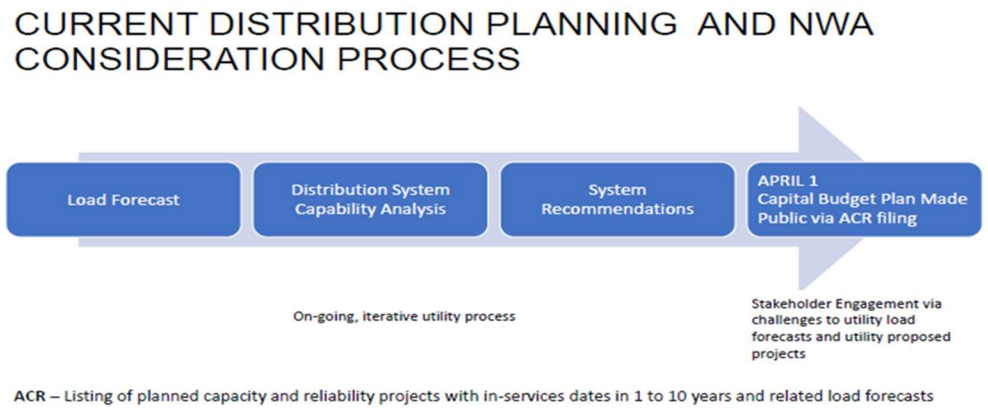

Figure 5. 3 – Pepco's Current Distribution Planning and NWA Consideration Process

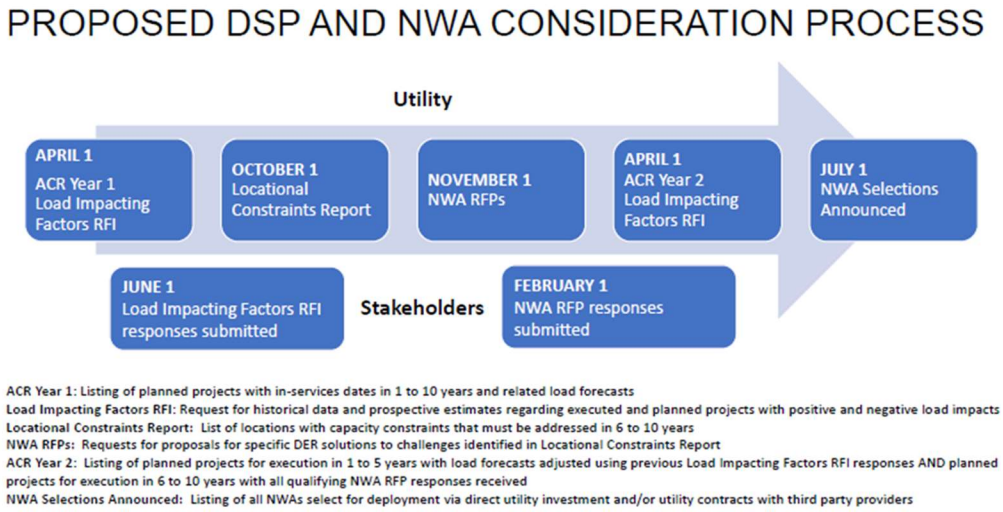

Figure 5. 4 – Proposed Distribution Planning and NWA Consideration Process (as of January 2019)

Credit: Pepco

The proposal presented in January 2019 details an interactive process that will evolve from the existing Annual Consolidation Report (ACR) to include stakeholder working groups, Load Impacting Factors Request for Information (RFIs), Locational Constraint Reports and NWA Request for Proposal (RFPs).

The proposed process included a Load Impact RFI, Locational Constraints Report and NWA RFP Process. In the January 2019 NWA Working Group meeting, several stakeholders complimented Pepco on its attempt to open up the distribution planning process to transparency and consideration of NWA projects.

- DCCA requested that Pepco add in stakeholder engagement opportunities for the DSP/NWA consideration process that is separate from MEDSIS. Pepco

agreed to look into where in the process stakeholders would benefit from workshops or working groups.

- DCCA requested that NWA projects include value stacking. Pepco clarified that RFP for the solution does not necessarily need to be for 100% of a project, meaning third-party NWA suppliers can value stack its projects accordingly to the RFP specifications.
- Grid2.0 thanked Pepco for moving this proposal forward internally and commented on the fact that D.C. Council may be taking up the question of a DER Authority this year. Pepco noted that any Pepco direct or indirect investment resulting from this NWA/DSP process would be subject to DCPSC review through a rate case process.
- DOEE noted appreciation for the presentation and the new elements of stakeholder engagement and NWA considerations. DOEE asked Pepco if hybrid solutions with multiple DER technologies in one RFP will be considered and if Pepco will work to build in as much flexibility into RFPs that can also fit the need of the system.
- DCSUN requested that facilitators provide more information on the DCPSC role in approving a Pepco NWA. Facilitators clarified that just like any other traditional grid investment, Pepco would be subject to DCPSC oversight of approving/rejecting rate recovery of NWA assets and/or contracts during general rate cases.

Pepco met with several stakeholders between the January 2019 and February 2019 meetings to iterate upon and refine their proposal. Pepco filed a revised version of the "Proposed District of Columbia Stakeholder-Informed Utility Distribution System Planning and NWA Consideration Process" in February 2019 – refer to Appendix A.6.2. During the February 2019 NWA Working Group meeting, Pepco presented the second iteration of its proposed DSP/NWA process that was modified after extensive stakeholder input. The second iteration of the proposal now includes an initial set of three stakeholder workshops and an additional Locational Constraint RFI that would occur between release of the Locational Constraints Report and the issuance of NWA RFPs. The additional Locational Constraint RFI gives third-parties an opportunity to give NWA "big ideas" for Pepco to consider as it formulates specific NWA RFPs. An illustration of the second version of the DSP/NWA process proposed in the February 2019 meeting is shown above in section 5.2.3.1 (see Figure 5.1).

In the February 2019 NWA Working Group meeting, several stakeholders continued the dialogue and refining process with Pepco on its second proposal to enhance the distribution planning process in the District.

- Tesla commented that the proposal is a good step forward. Tesla encourages Pepco to get going and have the learnings and evolutions start.
- Grid2.0 commented its support of the process and would put this proposal forward as a strategy for learning.

- DOEE commented that the proposal looked very promising and was interested in providing additional input directly to Pepco. Pepco replied that there is an open door welcoming additional input through March 2019.
- DCCA echoed comments that the proposal and iterative process is going in a very promising direction.
- Grid2.0 asked Pepco to clarify why there could be multiple RFPs for a single constraint and Pepco replied that the intention of doing this is to provide opportunities to stack solutions and to see how solutions work together and evolve over time. Pepco also reminded Grid2.0 that the purpose of the Locational Constraint Report is to inform the RFP process on where NWA projects would work.

There is a clear desire in the District to integrate and consider NWAs in lieu of traditional grid investments as part of the distribution system planning process. The recommendations made in WG2 are all intended to facilitate DER deployment in the District as non-wires alternatives. Establishing a definition, identifying classifications and adopting an enhanced process for distribution system planning are all key pieces to advancing DERs and grid modernization in the District. This process includes opportunity for stakeholder engagement as well as third-party market participation to provide NWA projects.

In a few other jurisdictions, the utility solicits NWA projects through an open and competitive process. The working group heard from an Avangrid representative who shared insights regarding a proceeding in Maine around whether a third-party coordinator or utility is best suited to take on the duties of managing the grid.

Based on learnings from speakers from Commissions and utilities in New York, California and Maine, the working group recognized the ultimate decision regarding the application of an NWA to a specific grid need often resides with the utility as does the responsibility for and risk associated with the resulting system performance.

Several process changes to the existing planning process have been proposed and discussed in the working group to increase stakeholder engagement and transparency while adding a process for the consideration of non-wires alternatives to traditional grid investments. The proposed process encourages two-way data flow between third-parties and utilities for load forecasting, DER installation and NWA selection. It is Pepco and the stakeholders' intention that the revised recommendation offered by the working group is a start to what will be an iterative and evolutionary distribution planning process in the District. The process should involve a review of load impacting factors and locational constraints, including collaboration between utility and non-utility stakeholders to provide historical and projected forecasts to inform load forecasting.

Stakeholders agreed that the newly legislated Building Energy Performance Standards in the DC Clean Energy Act should be factored into the calculation of baseline load forecasts. To address this, Pepco has suggested that DOEE will be a recipient of the Load Impacting Factors RFI. Additionally, Pepco and DOEE identified an opportunity to work together to ensure the Load Impacting Factors RFI is publicly accessible and

readily available for response by relevant stakeholders. It should be noted that the review and analysis of baseline load forecasting technique and methodology is out of scope of MEDSIS Working Groups. Some members of WG2 suggested that the DCPSC consider convening a load forecasting-specific workshop or develop a load forecasting white paper after the completion of the MEDSIS Working Group process.

As mentioned previously, version two of the DSP/NWA consideration process proposed in the February 2019 meeting (see Figure 5.5 and Appendix A.6.2) is not an end state. Stakeholders recognize the process is in a transitional state where all stakeholders can learn how the process works, including but not limited to NWA procurement and go-to-market strategies, NWA reimbursement structures and timeframe of NWA projects.

5.2.3.3 Stakeholder Positions

A. ABB supports this recommendation, adding "The operation of the distribution system is becoming more complex with the integration of DERs, non-wires alternatives, and deployment of additional grid edge technologies such as microgrids, field area communication networks, and distribution automation for automated switching and control and optimization of feeder voltages. Given this complexity and the utility responsibility to operate the distribution grid in a safe, secure, reliable, resilient, and efficient manner, plus addressing the grid's operational constraints and delivering on policy goals, the utility should control the distribution system planning process. Distribution system planning should be transparent and customer focused with safety, security, and reliability as the top priorities along with efficiency and affordability. We believe it is possible to achieve a cleaner grid while also maintaining the highest standards of safety, reliability, and customer focus. This proposal appears to be the logical next step in what will be an evolutionary planning process. In addition, this proposal informs stakeholders and engages them in the system planning process. We expect the utility will maintain system security and reliability, manage capacity requirements at the lowest possible cost to consumers, and create a framework and process that enables DERs to be deployed as NWAs."

B. Coalition for a Resilient D.C. (CRDC) supports part of the recommendation while opposing other parts of the recommendation. CRDC believes that Pepco review every currently-planned capacity investment >$1.5M to determine if a non-wires approach is a more cost-effective and better climate action option. CRDC also recommends that any RFI or RFP process, including the NWA selection process, should be run by a reliable, independent third-party, and involve various stakeholders including, but not limited to, Pepco. CRDC recommends that building owners and third-parties require access to building-level smart meter data in order to adequately develop DER projects and increase the success of potential non-wires solutions. Additionally, the visibility of a site's AMI data is essential for the ability to track performance and conduct measurement and verification of NWA projects. CRDC understands the importance of visibility and performance of these assets, but cautions against ambiguous statements

regarding Pepco's authority to control others' property. Pepco should provide specific examples on how and why Pepco should control NWA assets as opposed to leveraging less invasive methods of dispatch. CRDC recommends that the planning of the grid and deployment of NWAs must ensure 1) acceleration of the deployment of clean technology solutions, 2) load increases are managed effectively and at the lowest cost possible and 3) the creation of fair, reasonable frameworks for deploying DERs as NWAs. CRDC wants to ensure that any planning process in the District is "open, innovative and market-based ecosystem is needed to deploy DERs and other clean energy solutions in an accelerated, innovative and cost-effective manner while maximizing the benefits for the District." CRDC notes the importance of changing existing utility business models and market structures to "enable this new paradigm." CRDC believes that Pepco should play "a critical role in enabling this transformation" as a "system operator" responsible for "integrating and managing innovative DER solutions at an accelerated pace while maintaining the reliability of the grid." In order to do so, CRDC believes it is necessary to develop "an independent market operator" to "establish new market framework" to "develop and propose solutions to meet our grid needs and climate goals." CRDC notes that this process is "incredible complex and requires a platform with governance to establish equal legal weight and crowdsource input across all key stakeholders. CRDC proposes that the DCPSC establish working groups to "cover many of the key areas required to enable this new paradigm" such as "distribution system planning, market data access and market services."

C. DCCA supports this recommendation conditionally. Pepco's proposal is a welcome step forward, but the DCPSC should make changes to ensure that the public interest, including the District's clean energy legislation and goals, is always visibly placed foremost.

    a. DCPSC should review and approve the Locational Constraints Report (LCR) issued by Pepco ensuring, inter alia, that the "Load Impacting Factors" RFI responses are properly reflected in Pepco's load forecasts, and that the LCR accurately reflects hosting capacity changes made possible by advanced inverters or other relevant technologies.

    b. The LCR should include the "Load Impacting Factors" RFI responses and Pepco's load forecasts.

    c. DCPSC should approve the parameters for NWA solutions included in Pepco's "Locational Constraints" RFI for solutions to locational constraints.

    d. "Locational Constraints" RFI responses should be filed with the DCPSC.

    e. DCPSC should approve the RFPs for NWA solutions. This would ensure that the RFPs fully reflect the RFI responses proposing NWA solutions to location constraints ("Locational Constraints" RFIs), and do not omit proposals that would benefit the public.

f. The RFPs for NWA solutions should not prejudge the types of solutions.
g. DCPSC, or a DCPSC-appointed review board, should conduct the screening and selection of NWA proposals. This is important in guaranteeing that the public interest is protected, and in handling conflict of interest issues (e.g., if Pepco or an affiliate submits its own NWA proposal).
h. DCPSC should define and manage a process of review and improvement of the entire process, involving feedback from all involved parties, at the end of the first and second annual cycles. Recommendation 5.2.3 properly sees this as an "evolving" process and it should be treated as a pilot. It is reasonable to give it at least two cycles, preferably three, to evaluate the new process and test any changes in the process from one cycle to the next.
i. The process should apply not only to newly identified load constraints, but also to replacements of infrastructure and to upgrades of equipment that are not related to load. This would open these rate-based expenditures to solutions that are more beneficial to ratepayers.
j. The process should consider load and other requirements at a shorter time horizon than five or six years; three years would be more appropriate for NWA solutions to load constraints, and even less for NWA solutions to non-load-driven infrastructure replacements and equipment upgrades.
k. Multiple NWA solutions should be allowed in any single NWA response to an RFP.
l. It should be made clear that NWA initiatives that are not part of this process can go forward separately if they meet other criteria set by DCPSC and legislation.

D. DCSEU supports this recommendation, stating that [DCSEU] "DCSEU agrees that both existing and expanded energy efficiency or distributed generation programs are properly considered as NWA's, and that they will interact with and impact the nature and scale of procurement based NWA's that are sought through solicitations. The DCSEU looks forward to working with stakeholders in the NWA process to best characterize the potential for existing, and potentially expanded program activities to help meet potential locational constraints, and to be complementary to NWA solicitation and pricing-based activities. DCSEU "agrees with Maine and others that it is not helpful to have a new third-party aggregator." DCSEU stated that PEPCO, and the DOEE/DCSEU identified an opportunity to work together to ensure the LIF is publicly accessible and available for review. To support this process the DCSEU through evaluation and analysis of the new construction trends and changes in other existing baseline energy efficiency standards will help to facilitate the ongoing efforts on the identification and procurement of cost-effective NWAs."

E. DCSUN abstains from stating a position.

F. DOEE conditionally supports this recommendation, suggesting that "the following additions to the initial design: In between LIF and LCR, and in between LCR and NWA RFP, there should be a brief opportunity for review by government agencies to ensure that Pepco accurately incorporated the new data (provided by stakeholders) for LIF and the information in LCR are appropriately (i.e. not unduly restrictive or inflexible) reflected in the NWA RFP." DOEE "strongly believes that these minor additions, which should not add more than 1 to 2 weeks per review to Pepco's process, would be key to ensuring that the new process provides a modicum of transparency and accountability without externalizing the planning function away from Pepco. Without these additions, the planning process runs the risk of remaining a utility black box that it currently is." DOEE suggests that, in order for this recommendation to be a meaningful change, it "should also clearly state Pepco's intention that the process will be iterative and evolve, and that in the next iterative process, Pepco will consider, based on the results of the first NWA procurement, the following:

   a. Open procurement process, i.e. the RFP will not prescribe specific equipment and technology--rather the RFP will call for technology-neutral solutions to achieve a particular outcome, e.g., 4 MW reduction in a particular neighborhood.
   b. Expand beyond capacity constraints to consider reliability projects as well.
   c. Shorten time frame to 3+ years

G. EEI neither supports nor opposes this recommendation. EEI supports the MEDSIS process, as well as PEPCO's efforts to engage stakeholders, but EEI does not support opening distribution planning to stakeholder participation, nor does EEI believe that this particular process can or should be replicated in other jurisdictions.

H. Fluence supports this recommendation.

I. General MicroGrids supports this Recommendation as an integral step to feed into an eventual regulatory framework that addresses elements material to integrated distribution system resources planning, as, for example, the elements addressed in such models as CA's DRP and the NY REV initiatives. GMI, therefore, recommends that the Recommendation be modified, to include the following wording at the end, "that the process will be iterative and evolving and contribute to the development of a regulatory framework for Integrated Distribution Resources Planning." This Recommendation also should be coordinated with the development and implementation of the other Recommendations addressing the valuation of DER (BCA, Value of DER, and NWA) towards evolving a comprehensive regulatory framework.

J. Grid2.0/DCCUB/Sierra Club supports parts of this recommendation while strongly opposing many aspects of this recommendation.

a. Grid2.0/DCCUB/Sierra Club believes that Pepco's proposal is limited as it only "applies only to load-constrained areas they identify and does not include infrastructure replacement, upgrades for non-load issues, or other routine capital expenditures that might be better addressed with an NWA solution." Grid2.0/DCCUB/Sierra Club believes that this "unreasonably constrains the role of third parties of initiating NWA proposals and thus limits the potential full benefit to be gained from the expansion of this market to include innovative and nimble third party energy service companies." Grid2.0/DCCUB/Sierra Club is not in favor of Pepco having final "veto control over data, planning, specifications, and final selection of the [NWA] solution to a problem [Pepco] has revealed." Grid2.0/DCCUB/Sierra Club believes that there are "insufficient safeguards in preventing Pepco from controlling information and the process to their own advantage at the disadvantage to the other energy service companies in the marketplace."
b. Grid2.0/DCCUB/Sierra Club proposes that this recommendation should be considered a "pilot to evaluate Pepco's role in the distribution planning and NWA process."
c. Gri2.0/DCCUB/Sierra Club supports the notion of exploring an alternative approach to this proposal of a third-party planning authority for comparison, noting that "a third-party planning authority may work efficiently here and should not be summarily dismissed." Grid2.0/DCCUB/Sierra Club proposes that the working group should "outline the pros and cons of this approach to DER planning as a minority opinion to inform the current legislative exploration of this issue.
d. Grid2.0DCCUB/Sierra Club offered background on how the District could learn from California's experience on distribution planning. Grid2.0/DCCUB/Sierra Club asserted that "much could be learned from CAISO experience on this. An example is how the proposed process needs a framework and guidance for distribution resource planning and valuation. Such a framework and guidance would set requirements and definitions, especially for the uniform, consistent and verifiable methods for integration capacity analysis (Utility Host Capacity), optimal location net benefit analysis, and development of DER growth scenarios (Circuit to Feeders). A framework and guidance is necessary to inform and underpin distribution system DER planning and valuation, as well as an NWA Evaluation Process; and would assure consistency, verifiable findings, and a means for comparison against a baseline. Moreover, the methodology will not only inform load forecasting, but also develop DER growth scenarios. California's PUC has created a model that could serve to inform the development of the framework and guidance for DC." Grid2.0/DCCUB/Sierra Club adds that the CA Framework and Guidance for Distribution Resource Planning also requires each IOU Utility to propose a policy on data sharing and procedures for data sharing. IOUs

and stakeholders must also evaluate barriers to DER deployment relevant to DER Resource Planning and Valuation in terms of three categories: Interconnection/Integration onto Distribution Grid; Limits on ability of DER to provide benefits; Distribution System Operational and Infrastructure Capability to enable DER and Microgrid-provided value (Needed investment in advanced technology such as advanced protection and control systems, telecommunications and sensing)."
Grid2.0/DCCUB/Sierra Clubs also asserts that "an initial demonstration of a "California-type" Framework and Guidance for Distribution Resource Planning could be undertaken to begin to address the elements of the CA Model in parallel to the proposed Pepco-led NWA process."

K. GRID Alternatives MidAtlantic supports parts of the recommendation but stresses the importance of broad stakeholder input, not just centered on load issues, but also involving residents in decisions regarding the energy systems. The input of communities--especially disadvantaged communities—should be actively sought through tailored outreach, and meaningfully considered.

L. GridWise Alliance supports this recommendation, with the qualification that GridWise "understands that a separate proceeding apparently is underway to consider Pepco's load forecasting process." "GridWise appreciates the recognition that this process is in a "transitional state" and supports the recommendation that the "DCPSC should order Pepco to move forward with the proposal with the understanding that over the next few years, Pepco will incorporate lessons learned throughout to further improve and modify the process and be required to file ongoing updates to how the new process is working and how it can be improved." "GridWise concurs with the portion of the CRDC's recommendation that indicates that "the planning of the grid and deployment of NWAs must ensure 1) acceleration of the deployment of clean technology solutions," (of course, while ensuring system reliability and security are maintained and remain paramount) "2) load increases are managed effectively and at the lowest cost possible and 3) the creation of fair, reasonable frameworks for deploying DERs as NWAs."

M. NCS supports this recommendation.

N. OPC supports this recommendation as long as the process is a holistic system planning approach not a piece meal / patchwork approach.

O. Pepco supports this recommendation and notes that a similar system planning and non-pipe alternative consideration process for finding alternatives to gas projects may be worthy of future DCPSC consideration.

P. Sunrun supports this recommendation with modification. Sunrun supports this recommendation but would modify it to allow greater opportunities for stakeholder review and collaboration on items such as the draft RFP and contracts to ensure high-quality and robust proposals.

Q. WGL Energy generally supports Recommendation 5.2.3.1 recognizing that changes may need to be made with actual experience and with the

understanding that utility participation in grid investments should be constrained by existing legal prohibitions against Pepco owning generation.

5.2.4 RECOMMENDATION - DCPSC TO ESTABLISH ADVANCED INVERTER DEFINITION

5.2.4.1 Recommendation

DCPSC to consider the Final1.0 version of WG2 "advanced inverter" definition below and add to the list of MEDSIS definitions within FC1130:

Final1.0 "Advanced Inverter" Definition from NWA Working Group: "Advanced inverter" are inverters with a digital architecture, bidirectional communications and software that enable functionalities that provide autonomous grid support and enhance system reliability along with the capability to adjust their operational set points in response to the changing characteristics of the grid through dedicated communications protocols and standards. Advanced inverters must enable at the minimum, the following functionalities, as defined in IEEE 1547-2018: dynamic and real power support, voltage ride-through, frequency ride-through, voltage support, frequency support, and ramp rates.

5.2.4.2 Background

On November 3, 2017, the DCPSC proposed an amendment to Chapter 40 (District of Columbia Small Generator Interconnection Rules) that included a proposed definition of "smart inverter". On September 26, 2018, the Commission removed the definition from the proposed rulemaking and directed the consultant-led working group process in the MEDSIS initiative to develop a definition of smart inverter. The Commission designated the development of the definition to the Non-wires Alternatives to Grid Investment working group.

On October 25, 2018, the Non-wires Alternatives to Grid Investments working group convened to develop the draft working group charter. The stakeholders reached consensus that the alternative term—"advanced inverter"— shall be considered rather than "smart inverter".

Since 2017, the definition of advanced inverter has gone through an evolution in the District - as shown in Figure 5.5.

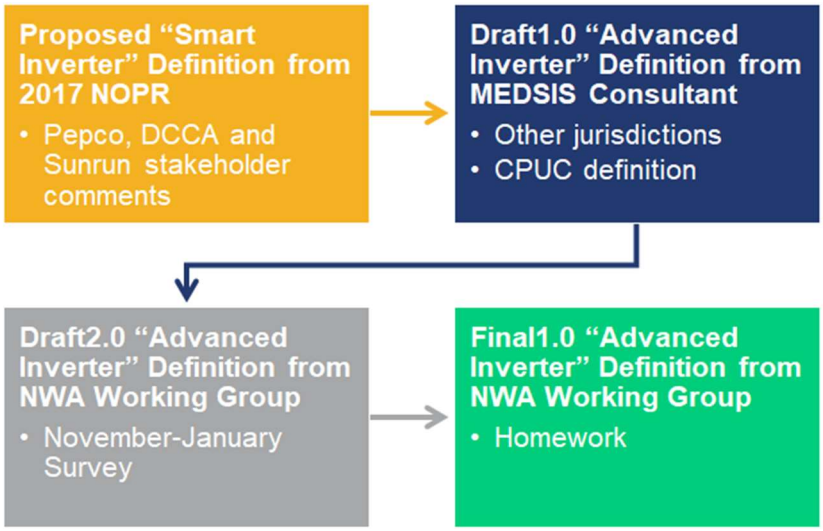

Figure 5. 5 – Evolution of MEDSIS Advanced Inverter Definition

Credit: MEDSIS Working Groups

As shown in Figure 5.5, in November 2018, the MEDSIS Consultant developed the Draft1.0 strawman definition of advanced inverter drawing from language used in other jurisdictions and incorporating the DCPSC proposed "smart inverter" definition from the 2017 NOPR along with its associated stakeholder comments from Pepco, DC Climate Action and Sunrun.

Draft1.0 "Advanced Inverter" Definition from MEDSIS Consultant: "Advanced inverter" are inverters with a digital architecture, bidirectional communications and software infrastructure technologies that enable at the minimum the following functionality as defined in IEEE 1547: voltage ride- through, frequency ride-through, voltage support, frequency support, and ramp rates.

In November 2018, nine stakeholders submitted comments on Draft1.0 via an online survey: Sunrun, Pareto Energy, DC Climate Action, Solar United Neighbors / Earthjustice, OPC-DC, Enbala Power Networks, Pepco and two independents. Based on results from the survey, the MEDSIS Consultant developed another working definition and during the December 2018 WG2 meeting, stakeholders developed Draft2.0.

Draft2.0 "Advanced Inverter" Definition from WG2: "Advanced inverter" are inverters with a digital architecture, bidirectional communications and software that enable functionalities that provide autonomous grid support and enhance system reliability along with the capability to control operational characteristics of the grid. Advanced inverters must enable, at the minimum, the following functionality, as defined in IEEE 1547: dynamic and real power support, voltage ride- through, frequency ride-through, voltage support, frequency support, and ramp rates.

In February 2019, MEDSIS Consultants developed a Final1.0 "Advanced Inverter" definition for WG2 consideration.

Final1.0 “Advanced Inverter” Definition from MEDSIS Consultant: “Advanced inverter” are inverters with a digital architecture, bidirectional communications and software that enable functionalities that provide autonomous grid support and enhance system reliability along with the capability to adjust their operational set points in response to the changing characteristics of the grid through dedicated communications protocols and standards. Advanced inverters must enable, at the minimum, the following functionality, as defined in IEEE 1547-2018: dynamic and real power support, voltage ride- through, frequency ride-through, voltage support, frequency support, and ramp rates.

5.2.4.3 Stakeholder Positions

A. EEI supports the definition in this recommendation but notes that other jurisdictions could adopt other definitions that would be equally appropriate for their purposes and circumstances.

B. DCCA supports this recommendation.

C. DCSEU supports this recommendation.

D. DCSUN abstains from stating a position.

E. DOEE supports this recommendation.

F. Fluence supports this recommendation.

G. General MicroGrids supports this recommendation.

H. Grid2.0/DCCUB/Sierra Club supports this recommendation.

I. GridWise Alliance supports this recommendation.

J. OPC supports the need for definition of advanced inverter, however neutral regarding the definition as further investigation into IEEE standards is needed as provided for in Recommendation 5.2.7.

K. Pepco supports this recommendation and notes that, for an advanced inverter that is not owned and operated by the utility to serve as an effective tool for enhanced system reliability, the utility (as the distribution system platform provider) must have communication with and the opportunity to control the advanced inverter.

L. Sunrun supports this recommendation.

M. WGL Energy supports this recommendation with the condition that all definitions including this one are adopted by the Commission when the Commission adopts rules that use the applicable definition. This will ensure that affected parties and the Commission will have a context for assessing its meaning.

5.2.5 LEARNING – STAKEHOLDER INPUT ON DCPSC RULES AROUND OWNERSHIP OF DERS

5.2.5.1 Background

The Government of the District of Columbia has established the DC Clean Energy Act which encourages the deployment of DERs. As the deployment of DERs increases, the DCPSC has been exploring appropriate regulations addressing utility ownership of DERs while adhering to existing statutes that prohibit electric companies from constructing generation for purposes of the retail sale of electricity without DCPSC approval.

On September 19, 2018 the DCPSC issued Order No. 19676 which directed WG2 to consider utility ownership of energy storage devices and other DERs. The DCPSC directed WG2 to submit its recommendation on the subject to the DCPSC for consideration within its final working group report. In FC1050, "In the Matter of the Investigation of the Implementation of Interconnection Standards in the District of Columbia," stakeholders discussed the scope of energy storage services to include distribution system reliability and resiliency services. The DCPSC determined that the issue of utility ownership of storage fell outside the scope of FC1050 and filed it within WG2.

During the February 2019 WG2 meeting, Energy Storage Association (ESA) presented on energy storage ownership and competition principles, regulatory recommendations and business models. The five ESA principles on ownership and competition are:

1. Ownership of storage should be open to all stakeholders
2. Ownership rules should seek to maximize value of storage
3. Regulations should be updated to reflect storage's unique qualities
4. Storage should be provided through a framework that promotes competition
5. Behind-the-meter (BTM) storage merits special considerations, based on the specific jurisdiction.

ESA presented four regulatory recommendations around ownership of energy storage and three recommendations specific to BTM applications.

1. In restructured markets, energy storage assets should be enabled to provide cost-recoverable transmission and distribution (T&D) and revenue-based market services.
2. Grid-connected systems should be enabled to provide end-user services, distribution system services and bulk system services simultaneously.
3. In restructured markets, regulated utilities should not be restricted from owning and operating energy storage.
4. Regulations should allow hybrid business models for utility and non-utility entities to provide distinct services in a single energy storage asset.

5. (BTM only) Identify opportunities and mechanisms for BTM energy storage (by end-use customers, third parties, utilities) to provide value to the grid.
6. (BTM only) Ensure utility ownership of BTM energy storage neither precludes nor disadvantages ownership by end-use customers or third parties.
7. (BTM only) Consider ways to mitigate structural differences between regulated utilities and third parties and customers in cost, risk and compensation associated with BTM storage.

In the February 2019 WG2 meeting, Tesla presented several national case studies in both restructured and vertically integrated markets. Tesla outlined opportunities for utility ownership of energy storage for grid reliability services and wholesale market participation. Tesla presented on the benefits of aggregated residential energy storage, highlighting two pilot projects in Vermont and New Hampshire. The working group expressed interest in residential energy storage pilot projects in the District. For the two pilot projects in Vermont and New Hampshire, a variety of behind the meter storage ownership models were used including third-party, customer and utility ownership of the behind the meter storage asset. In the case of the Vermont program, the utility (Green Mountain Power) partners with the customers to leverage the value of the battery. Green Mountain Power dispatches the storage assets to enable multiple value streams, including customer cost savings, frequency regulation, arbitrage and peak shaving.

Also during the February 2019 WG2 meeting, Fluence presented on energy storage applications located in front of the utility's meter for transmission and distribution deferral purposes and presented two energy storage ownership structures for this application:

1. Utility Owned
2. Third-Party Owned

Fluence described the two main functions of storage as market participation and grid reliability services. Fluence, ESA, and Tesla all recommended that performance requirements regarding assets serving grid reliability should be handled through bilateral contracts between a third-party and utility. The three organizations agreed that there are two categories of contracts for grid reliability services; one being for peak load which is predictable and the other being for N-1 type deferrals which is less predictable. The working group generally agreed that these bilateral contracts should be built with flexibility, starting as more conservative but modified over time as utilities and third-parties learn from experience and pilots.

After electricity deregulation in 1999, Pepco divested from generation and became a transmission-and-distribution-only (T&D) company. According to the Retail Electric Competition and Consumer Protection Act (1999 Act), electric companies are restricted from owning generation facilities in the District for the purposes of selling retail electricity. Over the past 10 years, DERs, including energy storage, have grown tremendously and regulators in the District (and across the country) are now grappling with rules around utility control, ownership, and operation of energy storage.

- California: In 2013, California set the first—and most aggressive—energy storage procurement target in the U.S. As a result of AB 2514, the target is 1,325MW (limited utility ownership of 50%) of operational storage by 2024 by the three investor-owned utilities (IOUs). In 2016, a second bill, AB 2868, was signed into law allowing 500MW to be rate-based by the three IOUs. AB 2868 allows utility ownership of behind-the-meter storage, as long as it does not unreasonably limit or impair the ability of non-utility enterprises to market or deploy energy storage systems.
- New York: The New York Public Service Commission (NYPSC) adopted a regulatory policy framework permitting utility ownership of DERs if: 1) the DERs meet a system need, 2) the DERs are integrated into distribution system architecture, 3) the DERs are used to serve low- or moderate-income customers, or 4) demonstrate learning from pilots.
- Maine: In February 2018, the Maine Public Utility Commission ruled to allow utility ownership of generation and energy storage if the asset improves grid reliability and efficiency.
- Illinois: In February 2018, the Illinois Commerce Commission (ICC) issued a final order which approved the Bronzeville microgrid and directed third-party ownership of generation if that is the most cost-effective ownership available, coupled with Commonwealth Edison Company (ComEd) ownership of the energy storage. The ICC also determined that due to the microgrid's distribution function, ComEd can recover costs via distribution formula rates.
- Massachusetts: In 2016, HB 4568 defined storage as a "commercially available technology that is capable of absorbing energy, storing it for a period of time, and thereafter dispatching the energy," and may be owned by a utility. In February 2019, the Massachusetts Department of Public Utilities (DPU) issued two orders on the state's storage rules that open up revenue streams to the utility, third-party developers and customers.
- Texas: The Public Utilities Commission of Texas has an active docket No. 48023 considering energy storage ownership, and released a 2019 report to the legislature asking for guidance on ownership.

Based on research from other jurisdictions and insights from industry experts, the working group discussed three main functionalities of DERs:

1. Electricity generation for wholesale market and/or retail sale to end-use customers
2. Supporting the reliability of the energy distribution grid
3. Providing ancillary services in the wholesale market

Current statutes in the District restrict electric companies from owning generation for purposes of retail electricity sale. However, WG2 discussed specific circumstances

existing today in the District where Pepco owns DERs for grid reliability services (i.e. Solar PV on a Substation). WG2 also identified certain scenarios where Pepco currently operates its Direct Load Customers (DLC) in the PJM markets, sharing revenues with ratepayers.

In February 2019, WG2 stakeholders were surveyed to gather their input around utility ownership of several different DERs in different capacities. Specifically, stakeholders were asked about behind-the-meter versus front-of-the-meter energy storage ownership and control, and wholesale market participation. In addition to energy storage, stakeholders also provided positions on other DERs, including solar PV, wind, electric vehicle charging infrastructure, biomass/waste-to-energy, cogeneration, and micro turbines. In total, there were 26 stakeholder respondents. Between the February and March 2019 meetings, stakeholders submitted additional comments and input to the MEDSIS Consultants. During the March 2019 meeting, stakeholders reviewed the results from the stakeholder input and further discussed potential rules around utility ownership of DERs. The culmination of survey results, stakeholder written input and working group discussions led to several conclusions for the DCPSC's consideration.

5.2.5.2 Conclusion

In response to the DCPSC request to develop rules around ownership of DERs, DCPSC should consider the stakeholder input on energy storage classification, energy storage operation in the wholesale market, energy storage ownership and control, solar PV ownership and ownership of additional DERs.

A. Classification of Energy Storage: The stakeholder input and working group discussions led to general agreement amongst stakeholders that the DCPSC should classify energy storage by its primary function and regulated accordingly.

B. Energy Storage Operation in the Wholesale Market: The stakeholder input and working group discussions led to a general agreement amongst stakeholders to allow utilities to operate energy storage assets in wholesale markets to the benefit of rate payers. DCPSC should continue to ensure that the utility's wholesale market revenues continue to offset the revenue requirement of the asset for the ratepayers' benefit. There were also several stakeholders who recorded their opposition to utilities operating energy storage assets in the wholesale markets.

C. FTM Energy Storage Ownership: The stakeholder input and working group discussions led to a general agreement amongst stakeholders that utilities should be allowed to own front-of-the-meter energy storage assets for the primary purpose of providing grid reliability services. DCPSC should continually reevaluate this recommendation to consider ownership for additional applications as energy storage applications evolve with time. When the utility owns the FTM energy storage asset for the primary purpose of grid reliability services and generates revenues from the wholesale market, the profits should be shared with rate payers.

D. BTM Energy Storage Control: The stakeholder input and working group discussions led to a general agreement amongst stakeholders that utilities should be able to control energy storage assets behind-the-meter if they are to be used as a grid reliability asset and only if customers and third party providers consent to such control. Control in this application should be defined in the contractual nature between the utility, third-party provider and customer-owned assets for dispatching to meet utility needs. The contract expenses for the utility to provide grid reliability can be considered part of the utility's rate base.

E. BTM Energy Storage Ownership: The stakeholder input and working group discussions led to a general agreement amongst stakeholders that utilities should not at this time be allowed to own storage assets behind-the-meter at this time. DCPSC should continually reevaluate utility ownership of behind-the-meter energy storage assets to consider ownership for additional applications as energy storage applications evolve with time. There were also several stakeholders who recorded their opposition, stating that utilities should be allowed to own behind-the-meter energy storage assets.

F. Solar PV Ownership: The stakeholder input and working group discussions led to a general agreement amongst stakeholders that utilities should continue to be allowed to own solar PV assets as long as it is not for the purposes of selling retail electricity to customers. There were also several stakeholders who recorded their opposition, stating that utilities should be allowed to own solar PV assets for the sale of retail electricity.

G. Additional DERs Ownership: The stakeholder input and working group discussions led to a general agreement amongst stakeholders that utilities should be allowed to own wind, biomass, waste-to-energy, cogeneration and/or micro turbine assets as long as it is not for the purposes of selling retail electricity to customers. Some stakeholders added that given the newness of the technology, the DCPSC could consider a threshold size to allow/disallow utility ownership for these particular types of DERs.

5.2.5.3 Stakeholder Positions

A. ConnectDER believes that utilities should be allowed to own solar PV for retail sales of electricity "only if net costs to ratepayers and participants can be demonstrated to be lower than if sourced via PPA."

B. DCCA agrees with the conclusion expressed in item A that energy storage should be regulated according to its function. With the imminent deployment of advanced inverters under the IEEE 1547- 2018 Standard, DERs will increasingly play a dual function by providing services behind the meter as well as to the grid, which will require an adaptation in regulation.

C. DCSUN partially supports this learning:

a. DCSUN supports this learning: C. Utilities should be allowed to operate energy storage assets in Wholesale Markets. DCPSC should continue to ensure that utility's wholesale market revenues continue to offset the revenue requirement of the asset for the ratepayers' benefit.

b. DCSUN conditionally supports this learning: D. Utilities should be able to control energy storage assets behind the meter. We understand that this recommendation pertains to demand response, but is concerned with the use of 'control.' 'Control' is a broad term that should be narrowed. DCSUN recommends that 'control' be changed to 'access energy storage assets behind the meter with the explicit permission of the customer-owner-generator."

D. DOEE opposes this learning as written and its agreement is dependent upon recommended changes. DOEE recommends that "the only DER that requires additional rule-making is storage, because it is not a standard generating asset and provides additional functionality that requires additional regulatory treatment. Other generating assets do not require additional treatment, because this would require a statutory change to Pepco as a T&D utility." DOEE also reiterates its "concern with this [learning] being based on a survey that was designed with a simple Agree/Disagree multiple choice answer to pre-written statements, some of which were written in a way that directly contradicts existing statute."

E. EEI acknowledges this learning with the following notes:

a. Regarding the learnings in "E" relating to the prohibition of the utility to own behind-the-meter (BTM) energy storage, EEI believes that there is no economic or legal basis or justification for preventing utility ownership of BTM energy storage (or any other resource), and that prohibiting ownership in this manner could ultimately harm consumers, as well as limit the growth of energy storage. There are several reasons for this, including but not limited to:

b. This prohibition could preempt the use of a potentially apt tool to help utilities meet their reliability obligations.

c. The prohibition can also prevent customers from benefitting from the lowest-cost option or from innovative programs that utilities could put together to the benefit of customers. In fact, utilities such as Green Mountain Power in Vermont and Liberty Utilities in New Hampshire, for example, are offering their customers utility-owned energy storage and solar PV + storage products.

d. This prohibition limits competition, which is precisely what proponents of this position are advocating. It is worth noting that the Energy Storage Association, the association representing the interests of the energy storage community, recognizes this fact and supports BTM ownership of energy storage assets by all stakeholders, including

electric utilities. Because of these same reasons, regarding the learning in "F" and "G" relating to the rules governing the ownership of solar assets and other DERs, EEI believes that lifting or modifying the existing restrictions (ownership is allowed except for the sale of retail electricity) would enable utilities to offer services that could be beneficial to customers.

F. Energy Forward states that "utilities should be allowed to deploy energy storage assets as non-wires alternatives to traditional grid upgrades however should only be focused on their local distribution area and not in the wholesale markets."

G. Fluence states that "in line with the criteria laid out by the Energy Storage Association, Fluence does not believe that any parties, including utilities should be disallowed from owning and operating energy storage, either in front of the meter or behind the meter, as doing so may limit competition for, and access to, energy storage solutions." Fluence supports "efforts to ensure end-use customers, third parties, and utilities are able to compete fairly to purchase, own and operate energy storage assets.

H. General MicroGrids supports this learning.

I. Grid2.0/DCCUB/Sierra Club supports this learning, suggesting that the utility's role in owning DERs "should be restricted to less than half of all assets to encourage third-party investment and streamlined utility interconnection."

J. GRID Alternatives MidAtlantic generally supports this learning, emphasizing that that utilities should continue to be allowed to own solar PV assets only as long as they are not on the demand side and/or for the purposes of selling retail electricity to customers. The current rules prohibiting utility ownership of generation are important for the integrity of the deregulated market, and those principles should be maintained.

K. GridWise Alliance states that the re-evaluation of utility ownership of front of the meter energy storage is not needed here. GridWise Alliance also supports utility ownership of behind-the-meter energy storage assets. GridWise Alliance also believes that "storage doesn't fit into the traditional buckets of generation, transmission and distribution, and `should be recognized for its range of services, opportunities and benefits.'"

L. Microgrid Architect conditionally supports this learning, mentioning however that "the wording on the restrictions on Pepco ownership of generating assets – "as long as it's not for the purposes of selling retail electricity to customers" – is not precise, and reflects neither the language nor the intent of the 1999 restructuring legislation." Microgrid Architect also states that "detailed attention is required to ensure utility ownership does not crowd out private investment" and recommended a potential "cap on market share" for utilities assets entitled to rate recovery. Microgrid Architect also believes that "reliability should include hosting capacity and load-shifting."

M. Microgrid Resources Coalition (MRC) states that energy storage classification of generation vs. multi-purpose "depends on the location and the primary purpose of the energy storage and location on either side of the point of common coupling." MRC believes that utilities should be allowed to aggregate behind-the-meter energy storage assets "via the use of Distribution Support Service Agreements and third-party ownership."

N. NRG Energy states the importance of having "market environment and platforms to attract private investment" and discusses the benefits of "sending proper price signals for efficient allocation of capital to grid assets." NRG also notes the infancy of energy storage resources and stated that it "would be better to allow private investment to take the risk and uncertainty with new technologies instead of subjecting rate payers to costs." NRG Energy also states that "VPPs [Virtual Power Plants] should be controlled by private enterprise and optimized by responding to efficient market price signals."

O. NV5 states that "allowing utilities to participate in ancillary services wholesale markets opens the door to a pseudo-vertically integrated entity."

P. OPC conditionally supports this learning. OPC reiterates the importance of "the application for utility ownership of front-of-the-meter energy storage assets be used exclusively to support the reliability of the electric grid and not as a dispatchable energy resource." OPC proposes that the recommendation regarding wind, biomass, waste-to-energy, cogeneration and microturbine assets be modified to read: "Because these DERs are far from development and implementation in the District, DCPSC should explore further the need to determine whether there could be a ratepayer interest purpose for utilities to own wind, biomass, waste-to-energy, cogeneration and microturbine assets that does not include selling retail electricity to customers.

Q. Pace Energy and Climate Center notes that utilities should only be allowed to own or operate DERs under these provisions listed in the recommendations above "only if the market is proven to be incapable."

R. Pareto Energy conditionally supports this learning only if "the decision over interconnecting storage resources (or any DERs) has been unbundled from the utility."

S. Pepco acknowledges this learning with the following notes:

    a. Pepco affirms the general understanding of current DC law documented in this learning as allowing the utility to own of DERs (including storage) for uses other than retail electricity sales;

    b. Pepco understands the proposed review in item 'C' to be intended to consider opportunities to expand the use cases for allowed utility ownership of energy storage for purposes other than grid reliability;

c. With regards to item 'E', Pepco believes the utility should not be precluded from BTM storage ownership. However, understanding that the proposed limitation of utility ownership of storage to front of meter applications is seen to be 'for the time being' and reflects a desire to allow for the development of a competitive behind the meter (BTM) storage market, Pepco notes that, at a minimum, the utility should be allowed to advance the establishment of this competitive BTM market through utility customer rebates and discount programs and utility programs for underserved communities.

T. NCS generally supports this learning, emphasizing that that utilities should continue to be allowed to own solar PV assets only as long as they are not on the demand side and/or for the purposes of selling retail electricity to customers. The current rules prohibiting utility ownership of generation are important for the integrity of the deregulated market, and those principles need to be maintained. Additionally, electricity generated by utility-owned PV assets should not be eligible to accrue Solar Renewable Energy Credits (SRECs), nor should they count toward the District of Columbia's Renewable Portfolio Standard (RPS), nor the "solar carve-out" of the RPS. The utility should be restricted from generating, owning and trading the potential SRECs from its solar PV assets.

U. Tesla notes the examples of energy storage serving purely transmission and distribution functions, stating that energy storage should "not only be considered as a generation resource."

V. WGL Energy notes the upfront importance on addressing utility ownership of DERs while adhering to existing statutes that prohibit electric companies from constructing generation for the purposes of the sale of electricity without DCPSC approval. WGL Energy states that utilities should only be allowed to own wind, biomass, waste-to-energy, cogeneration and microturbine assets as long as it is for the utilities own use and it's not for purposes of selling retail electricity to customers, referring to current law that prohibits utilities from "owning these facilities unless for their own use. WGL Energy notes that control in Section 2.5.3.D: control energy storage assets behind-the-meter under the terms of an approved tariff, must be defined for the utility in a tariff. WGL supports the proposition that energy storage function should be determined based upon its use. WGL Energy opposes utilities being allowed to market or offer energy storage assets in the wholesale market. WGL Energy supports the recommendation that utilities not be allowed to own behind-the-meter storage assets, stating the private sector should provide behind-the-meter assets.

5.2.6 LEARNING - NEED FOR DEMONSTRATING NWA PROJECTS IN THE DISTRICT

5.2.6.1 Background

The barriers of entry for NWA projects were discussed throughout the stakeholder working group process. The major challenges other jurisdictions are facing around distribution system NWA projects are finding NWA projects on the distribution system with positive economics relative to traditional solutions, executing NWA project contracts, and developing revenue mechanisms that allow for appropriate utility earnings on utility-owned and third party-owned NWAs. Avangrid identified some of these challenges during the January 2019 WG2 meeting, discussing the difficulties they are having with executing NWA project contracts with third-parties in New York. These stakeholder discussions revolved around the issues of performance requirements of NWA projects and managing the risk of not meeting such requirements. WG2 generally agreed that the contract mechanisms and earning structures of NWA projects should be tested and demonstrated through an NWA pilot project. The mechanics of leveraging DER assets, both demand-side and utility-side of the meter, can also be demonstrated through a NWA pilot project. Grid2.0/DCCUB, DOEE/Urban Ingenuity and Sunrun proposed three potential pilot or demonstration projects in the District. The ideas discussed are summarized below and can be found in more detail in Appendix A.6.

- Grid2.0/DCCUB stated within its comprehensive MEDSIS pilot proposal that there is general agreement amongst public interest and clean energy advocates that DER have the potential to replace fossil fuel energy sources, democratize the energy marketplace, advance ratepayer choices and contribute to the management of peak load. This potential pilot could demonstrate if these objectives can be achieved with an assortment of DER, including demand-side management and efficiency, distributed generation and energy storage being collectively managed to balance supply and demand for power, and to shift load to manage peak demand. The ultimate goal, as expressed by Grid2.0 is to equitably share the benefits from DER integration into the grid between the utility and other stakeholders, including ratepayers. In order to ensure the utility remains stable, this potential pilot could also test contract and revenue earning mechanisms associated with NWA projects and potential PIMs. Recommendation 5.2.3 current is limited to NWA projects for capacity constraints, however this pilot potentially could test packages of DERs to be managed in real-time to provide speculative benefits that remain to be demonstrated, such as load shifting, reliability and maintenance of power quality. Grid2.0/DCCUB's proposal includes several key attributes of potential NWA pilots that should be considered in any future NWA pilot projects in the District. Grid2.0/DCCUB's proposed pilot recommendations are included in Appendix A.6.3.
- DOEE/Urban Ingenuity presented a NWA pilot project proposal they felt should be considered in the District. The proposal included a pilot project for aggregated solar PV, advanced inverters, demand-side management, energy storage and microgrid controls to address hosting capacity issues and potentially provide services to Pepco as a NWA project. Grid2.0/DCCUB also submitted recommendations to develop NWA pilots, which can deploy demand-side

management and other DER technology to defer traditional grid investments. The proposal presented by DOEE/Urban Ingenuity would facilitate the deployment of District-local solar PV, testing NWA ownership and operation contract mechanisms, and demonstrating the secure two-way data sharing between Pepco and third-parties, as recommended in Recommendation 5.1.8. DOEE/Urban Ingenuity's proposed pilot recommendations are included in Appendix A.6.5.

- Sunrun presented a pilot project proposal called a "Bring Your Own Device" (BYOD) demand management program. Comparable programs are currently offered in Vermont and Massachusetts, and soon in New Hampshire (Liberty Utilities) and New York (PSEG Long Island). They utilize third-party aggregators with pay-for-performance contracts, similar to demand response thermostat programs or commercial and industrial processes. The program would involve an open solicitation for third-party aggregators to install residential storage systems that can be aggregated and simultaneously discharged to manage load and reduce peak demand. The objective of a BYOD program would be to facilitate the development of energy storage in the District and utilize customer-sited DERs as system resources to produce benefits for all ratepayers. Sunrun stated that utilizing residential behind-the-meter storage systems (as opposed to utility-owned systems) would support the competitive and cost-effective deployment of energy storage in the District. Customers would also use the battery for back-up generation during outages, improving resiliency. Third-party aggregators would control the charge and discharge of the batteries generally, dispatching them during expected peak periods to reduce PJM transmission charges. Pepco would provide peak prediction and a dispatch notice. Participating system owners would receive compensation from PEPCO via a 10-year tariff (on a $/kW-year basis) for their performance during called or scheduled events. A higher level of compensation would be offered in congested areas of the grid most in need of load relief to incent adequate deployment. A more detailed description of Sunrun's proposal is available in Appendix A.6.6.

The NWA pilot can test several key components of NWA projects including but not limited to demand-side management, aggregated solar PV and energy storage, advanced inverter functionalities, NWA business models and ownership structures and appropriate NWA contract mechanisms. This pilot can include attributes of the DSP/NWA process proposed by Pepco in Recommendation 5.2.3, attributes of the comprehensive pilot proposed by Grid2.0/DCCUB, attributes of the solar saturation solution proposed by DOEE/Urban Ingenuity and attributes of the BYOD pilot project proposed by Sunrun.

5.2.6.2 Conclusion

There is an opportunity for exploring NWA pilot and demonstration projects to address the various components of NWA projects in the District. Stakeholders in the working

group discussed three specific NWA pilot project ideas for consideration as a potential pilot or demonstration project in the District.

1. Grid2.0/DCCUB's comprehensive NWA pilot project in Appendix A.6.3
2. Urban Ingenuity/DOEE's solar saturation solution project in Appendix A.6.5
3. Sunrun's "Bring Your Own Device" (BYOD) pilot project in Appendix A.6.6

5.2.6.3 Stakeholder Positions

A. DCCA states that "the District would benefit from having a number of independent NWA pilot projects to test key components of NWAs."

B. DCSUN abstains from stating a position.

C. DOEE states the "the narrative should clearly indicate that the proposal was made primarily as a hosting capacity expansion pilot project with NWA features. There should be a recommendation for action on hosting capacity constraints, which WG2 was tasked with addressing by the PSC. The solar saturation microgrid is one example of how hosting capacity can be addressed, but is not the only possible solution. The 100% RPS for DC includes a 10% solar carve-out, and this goal cannot be met without hosting capacity solutions."

D. EEI acknowledges this learning but would like to note that, while pilot and demonstration programs can be very beneficial, the projects considered in a potential program should not be limited to the three that were presented to the stakeholders within the NWA working group.

E. General MicroGrids supports this learning.

F. Grid2.0/DCCUB/Sierra Club "admires the solar saturation solution that was proposed for a residential feeder in Congress Heights, but it involves a much smaller subset of technologies and economic factors." Grid2.0/DCCUB/Sierra Club mentions "that it could be cloned in other areas of the District, but the applicability is limited." Grid2.0/DCCUB/Sierra Club strongly opposes this as a learning and proposes that the comprehensive MEDSIS pilot project as proposed by Grid2.0 should be put forth as a comprehensive recommendation for the MEDSIS pilot.

G. GRID Alternatives MidAtlantic generally supports this learning, but suggests that it could be framed as a recommendation to consider pilot projects.

H. GridWise Alliance supports the types of components highlighted in this learning.

I. OPC supports NWA pilot projects but doesn't support any specific pilot project.

J. Pepco supports this learning. Pepco is excited to work with District stakeholders on demonstration projects and NWA solutions such as the proposals listed above. Further, Pepco notes that an NWA demonstration that does not apply for MEDSIS pilot funding could be executed in advance of completion of the first

round of implementation of the DSP/NWA proposal (Recommendation 5.2.3) and Pepco is actively seeking opportunities to do these types of NWA demonstrations with a variety of DER ownership and program execution models.

5.2.7 RECOMMENDATION – DCPSC TO ESTABLISH STAKEHOLDER WORKING GROUP ON IEEE 1547-2018 STANDARDS AND ADVANCED INVERTER DEPLOYMENT

5.2.7.1 Recommendation

DCPSC should establish a stakeholder working group to plan deployment of advanced inverters and implementation of IEEE 1547-2018 as specified in DCCA's proposal in Appendix A.6.1.

5.2.7.2 Background

Working group stakeholders established a common understanding that the new IEEE 1547-2018 Standard, with which the DCPSC now mandates compliance, requires DERs to be capable of providing specific grid supportive functionalities relating to voltage, frequency, communication and controls. The deployment of specific settings and functionalities that ultimately are adopted in the District are reliant on technical discussions and completion of testing protocols and equipment certification that are on-going by Pepco. Pepco is looking at the new IEEE standard and plans to adopt it as soon as the associated Underwriters Laboratory certification testing is completed. PJM does not have jurisdiction over DER interconnection rules in the District and which IEEE 1547-2018 capabilities are chosen, but it requested that the District implement the Ride Through and trip settings functionalities of IEEE 1547-2018 Standard to meet transmission needs. PJM also encouraged that this happen by 2022 and that convening a transparent working group to develop these specific settings will be required. D.C. Climate Action (DCCA) similarly proposed that the DCPSC should establish a stakeholder working group to plan the deployment of advanced inverters and IEEE 1547-2018 standards by 2022 to meet distribution needs aligned with the District's statutory clean energy and DER mandates. This working group's scope would include choice of functionalities to be adopted and related tracking, rulemaking, policy considerations and stakeholder education. Additional details on DCCA's proposal are included in Appendix A.6.1. There was general agreement that such a group would require considerable technical expertise, including from a range of technically-versed stakeholders, to determine specific standards and settings.

5.2.7.3 Stakeholder Positions

A. DCCA supports this recommendation.

B. DCSUN fully supports establishing stakeholder engagement and education on IEEE 1547-2018 with the explicit goal of implementing these standards in the District. As well as community organizations, individual energy producers, large

and small, should also participate in the stakeholder groups to assess the economic impacts of implementing these standards.

C. DOEE supports this recommendation and notes the importance of "the hosting capacity problem" in the District.

D. EEI supports this recommendation but also would like to note that it may be unnecessary to convene a working group to discuss the implementation of IEEE 1547-2018, as most aspects of its implementation are the responsibility of PEPCO. The implementation of this standard will require extensive education of the different parties, but EEI does not believe that a stakeholder group, supposedly similar to the one formed in the MEDSIS proceeding, would have the adequate expertise or resources to assist in that area. Further, EEI believes that forming a working group to discuss goals for advanced inverters deployment is unnecessary at this point. The deployment of smart inverters should be tied to the deployment of the resources that they support. Discussing the deployment of smart inverters would be tantamount to discussing the deployment of DERs, which a stakeholder working group should not do in the absence of additional policy or regulatory guidance and direction. EEI believes that educational workshops will be more effective in educating stakeholders and in soliciting their input when and where it may be needed.

E. General MicroGrids supports this recommendation.

F. Grid2.0/DCCUB/Sierra Club supports this recommendation.

G. GRID Alternatives MidAtlantic generally supports this recommendation, emphasizing the utmost importance of fair, balanced and transparent stakeholder processes to ensure that the perspectives of all impacted stakeholders are reflected, especially disadvantaged communities that could be more sensitive to some of the positive and negative impacts of adopting the new standard.

H. GridWise Alliance supports "Support the need for additional stakeholder engagement to articulate the goals that should inform advanced inverter deployment but note that charting the application of IEEE 1547-2018 is technically complex and should be led by experts.

I. NCS supports this recommendation.

J. OPC supports this recommendation.

K. Pepco supports this recommendation with the qualification that, given the technicality of advanced inverter standards and deployment, a variety of knowledgeable participants at the working group meetings suggested that the proposed working group would best be focused on setting goals for advanced inverter deployment, leaving the details of standards implementation and advanced inverter deployment planning to engineering experts.

L. Sunrun supports this recommendation.

M. WGL Energy supports this recommendation.

5.3 Rate Design

5.3 Rate Design							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.3.1	DCPSC to Reconvene a Working Group to Develop a Specific Residential Dynamic Pricing Program			x	x		
5.3.2	DCPSC to Initiate a Value of DER and Value of Grid Study	x	x	x	x	x	
5.3.3	Learning: Performance Based Regulation (PBR) in the District		x	x		x	

Table 5. 8 – WG3: Rate Design Recommendations and Learnings

5.3.1 RECOMMENDATION – DCPSC TO RECONVENE A WORKING GROUP TO DEVELOP A SPECIFIC RESIDENTIAL DYNAMIC PRICING PROGRAM

5.3.1.1 Recommendation

By October, 2019, the DCPSC should reconvene the Dynamic Pricing working group that previously existed in the District and direct them to formulate the details of a new residential dynamic pricing program(s). The working group should be convened for a defined time frame – ideally with the goal of developing a program(s) that can be submitted for approval by the DCSPS in time for the 2020 cooling season. The DCPSC should conduct ongoing monitoring of the dynamic pricing program, once implemented, to ensure program elements are evolved, as needed, to address PJM market changes, increasing penetration of DERs, program role as a NWA to system build out, and customer feedback.

5.3.1.2 Background

In the February 2019 Rate Design Working Group (WG3) meeting, Pepco shared a presentation entitled, "Pepco Recommendation to MEDSIS Rate Design Working Group: A Path Forward to Dynamic Pricing," in which Pepco recommended the Commission institute a working group to develop a dynamic pricing program for residential electric customers in the District. This proposal to develop a working group received broad support from the WG3 attendees during the meeting.

Pepco's presentation reviewed the PowerCentsDC program, which received high customer satisfaction scores and demonstrated the value of dynamic pricing in the District. Pepco also presented learnings from their similar programs in Maryland (MD) and Delaware (DE) both of which are established, large-scale dynamic pricing programs, as well as learnings from Baltimore Gas & Electric's (BGE) dynamic pricing program in Maryland. Pepco explained that together these programs represent approximately 2 million customers in the Mid-Atlantic region who have enrolled in

dynamic pricing programs and represent a large body of knowledge on the effectiveness and popularity of these programs.

From Pepco's presentation, WG3 stakeholders learned how, if properly designed, a dynamic pricing program could be advantageous to customers in many ways including reductions in volumetric chargers resulting in bill savings, deferral or reduction of transmission and distribution upgrades, and reduced air emissions when usage minimizes the use of carbon producing generation. The working group also learned that Pepco customers in MD and DE have recorded high levels of customer satisfaction with these programs as documented in focus groups and customer surveys.

Pepco's proposal recommended this working group define all dynamic pricing elements needed to facilitate DCPSC approval of the program such as:

A. Rate Class Applicability – Expected to be Residential Only
B. SOS versus Third-Party Supplier Applicability
C. Opt-In versus Opt-Out
D. Critical Peak Rate – Basis for kWh Rebate Amount and Source of Funding
E. Customer Baseline Calculation
F. Event Triggers
G. PJM Market – Energy and Capacity Market Options
H. Interaction with Existing Residential Direct Load Control Program
I. Pepco Dynamic Pricing Billing and Metering Capabilities
J. Customer Education Plan Including Initial Educational Materials and Ongoing Communications/ Event Notifications

In the April 2019 MEDSIS joint working group session, stakeholders felt the working group to be established should be a reconvening of the Dynamic Pricing working group that previously existed and that this working group should be ordered to reconvene by October, 2019 and to meet for a defined period of time at the DCPSC's discretion. The working group established should meet on a recurring basis as determined by working group members and recorded in their charter. The working group should coordinate its efforts with other working groups, as applicable, and should strive to create a program that can be implemented in a phased approach.

DCPSC should direct Pepco to provide reports to the DCPSC on the status of any new program that gets implemented. Reports could include data on customer enrollment, customer satisfaction, load impacts, and bill impacts. Pepco should make recommendations for refinement of the program or on additional dynamic pricing strategies that could be suitable to offer as residential retail electricity options.

5.3.1.3 Stakeholder Positions

A. AOBA opposes this recommendation does not support a CPR program for any class of customers in the absence of clear specifications of the benefits the program is targeted to achieve and clearly developed ties between the load reductions targeted and the value of the benefits that are expected to result. Distribution system facilities are not designed for loads that can be readily altered through customer response to CPR incentives. Moreover, there has been no demonstration that load shifting through CPR will be sustainable over the lives of the affected distribution facilities.

B. Arcadia Power supports this recommendation. While we recognize that this is very close to the monopoly utility providing value-added services that should be provided by the competitive market, we believe that dynamic pricing is a reasonable way to provide standard utility service. Further, dynamic pricing will lead to more opportunities for third parties to help consumers manage their load, whether or not that customer receives commodity service from a retail supplier.

C. DCCA supports conditionally:

   a. The term "dynamic pricing program" should be interpreted to mean a series of options offered to ratepayers, beginning with Pepco's preferred Critical Peak Rebate (proposed for the 2020 cooling season) but going on to offer other options. These may include revival of the two other options piloted in the District's "PowerCentsDC" Program years ago (real time pricing and critical peak pricing) and related time-of-use pricing options.

   b. The Commission should assign reasonable target dates by which the working group should complete its work on the first and subsequent options. The dynamic pricing working group should be a stakeholder working group not limited to the original members.

   c. The Commission should also be aware that the working group also discussed other dynamic pricing options than the Critical Peak Rebate, and that support for this recommendation by a number of parties was contingent on its going beyond Pepco's preferred Critical Peak Rebate program

D. DCSEU generally supports this recommendation.

E. DCSUN abstains from stating a position on this recommendation.

F. DOEE supports this recommendation.

G. EEI supports this recommendation with caveats. EEI is in favor of development of a dynamic pricing program but believes it should be aligned with programs already envisioned by PEPCO, such as a Critical Peak Rebate Program. Further, EEI is concerned about reconvening a working group to determine specific features of an electric rate or pricing program. Working groups are useful to debate broad policies and direction but are highly inefficient—and often

ineffective—when it comes to specific rate design features (e.g., exact pricing, time windows, opt in/out, etc.). Further, the practice of using a working group to discuss the specific features of rate designs is highly unorthodox for good reason – there would be little way to ensure that working group participants have the necessary skills, education, and experience to understand the issues and provide meaningful suggestions. Efforts to bring parties up to speed on rate design fundamentals could derail and delay necessary discussions about important rate design function and outcomes – discussions that are best had between an electric company and their regulators, with intervening parties offered the opportunity to engage and debate

H. General MicroGrids supports this recommendation.

I. Grid 2.0/DCCUB/Sierra Club support this recommendation. Grid2.0/DCCUB/Sierra Club recommend that the Dynamic Pricing working group have two objectives:

   a. Formulate the details of a Critical Peak Rebate (CPR) Program for submittal to the Commission for their approval in time for the 2020 summer cooling season. The working group should define all CPR Program elements needed to facilitate Commission approval such as: Rate Class Applicability (Expected to be Residential Only), SOS versus Third-Party Supplier Applicability, Opt-In versus Opt-Out, Critical Peak Rate (Basis for kWh Rebate Amount), Customer Baseline Calculation, Event Triggers, PJM Market (Energy and Capacity Market Options), Interaction with Existing Residential Direct Load Control Program, Pepco Dynamic Pricing Billing and Metering Capabilities, Customer Education Plan, and Rebate Cost Recovery Method.

   b. Ongoing monitoring of the CPR program, once implemented, and evaluation of additional dynamic pricing strategies to evolve program elements as needed to address PJM market changes, increasing penetration of DERs, program role as a NWA to system build out, and customer feedback. The working group should meet on a recurring basis as determined by working group members and recorded in their charter. Pepco should provide reports to the working group on the status of the new CPR rate with relevant data on customer enrollment, customer satisfaction, load impacts, bill impacts, etc. The working group should convene for at least 1 year after the roll-out of the new rate to make recommendations for refinement of CPR and to report on what additional dynamic pricing strategies could be suitable to offer as residential retail electricity options.

J. GRID Alternatives Mid Atlantic conditionally supports the recommendation for a working group, but believes it is crucial that the reconvened working group keep the perspectives of low-income District households in the foreground of all discussions. The working group should also assess if those households should

be exempted from dynamic pricing, given the uncertainty of such pricing mechanisms. GRID Alternatives Mid Atlantic maintains a goal that low-income households and disadvantaged communities do not suffer negative consequences from dynamic pricing.

K. Gridwise Alliance conditionally supports the recommendation. Gridwise feels it is not the working group's role to conduct ongoing monitoring of any program established. Gridwise also feels if the DCPSC determined changes were needed to the program that "…maximum transparency…" was needed through "… further stakeholder participation".

L. NCS supports this recommendation.

M. OPC conditionally supports the recommendation but believes that the last sentence should read simply "The DCPSC should conduct ongoing monitoring of the dynamic pricing program(s), once implemented, to ensure it continues to evolve appropriately." While OPC agrees that the program should evolve to address, among other things, PJM market changes and customer feedback, the evolution of the program should be tasked to Pepco and to stakeholders to work collaboratively together. Because the future is yet unknown, the recommendation should not specify what issues the program will need to address in the future.

N. Pepco supports the recommendation to reconvene the Dynamic Pricing working group for a defined period of time for the sole purpose of developing a new Residential Dynamic Pricing program (preferably in the form of a Residential Critical Peak Rebate). Pepco agrees with the aspirational goal of completing the working group's proposal such that it can be approved by the Commission and implemented in time for the 2020 cooling season. Pepco does not, however, believe that active and ongoing monitoring of the program by the Commission is necessary. Instead, reporting requirements (agreed upon by the working group) should be put in place at the time the program is approved so as to allow Pepco to (a) provide the status of the program to the Commission on a periodic basis and (b) help provide the basis for any future recommended changes to the program by the Company to reflect changing market, system, and customer dynamics."

O. Sunrun supports this recommendation on the condition that it be an optional, opt-in rate for residential customers.

P. WGL Energy generally supports this recommendation becoming a learning rather than a recommendation since it lacks sufficient detail. WGL Energy made the point previously that absent further detail with regard to Dynamic Pricing, the Draft Report's Rate Design Dynamic Pricing Recommendation should be shifted to a Learning designation.

5.3.2 RECOMMENDATION – DCPSC TO INITIATE A VALUE OF DER AND VALUE OF GRID STUDY

5.3.2.1 Recommendation

WG3 recommends the DCPSC hire an outside consultant to produce a methodology for determining the locational value of DER with a target completion date of 2021. The costs of the study should be paid from the MEDSIS pilot funds. Completion of the study should not impact the schedule for conducting other MEDSIS pilot projects.

5.3.2.2 Background

In the March 2019 working group meeting, WG3 stakeholders discussed a proposal submitted by DOEE suggesting the working group recommend the commission conduct a locational value of DER study. DOEE's rational for this suggestion was that while the working group had discussed alternative rate designs that incentivize customer or utility behavior, it had not discussed rate designs that would appropriately compensate for DER. DOEE noted that deploying DER cost-effectively requires a methodology for estimating and compensating for the actual, calculable benefits that DER provides to the distribution system. DOEE noted that other jurisdictions have found such a methodology may assist in the development of a robust and competitive markets for DER by sending clear price signals for investments and business opportunities (including markets for distribution ancillary services). DOEE noted that, without such a compensation methodology, planning for non-wires alternatives and microgrids, and promotion of DER in general will continue to struggle; in addition, without such a methodology, some DER resources may be over-compensated, while others may be under-compensated.

Pepco noted the Distribution System Planning and NWA Consideration Process proposed and recommended for DCPSC consideration in Recommendation 5.2.3 would create a competitive market for NWA solutions that would address this concern in the NWA context. Overall, a lack of predictability about the value of DER, both locational and temporal, could hinder robust development of DER in the District even if the spatial challenges with siting DERs in the District was overcome.

Regardless of how applied, it was acknowledged by the group that any study done would not be a "one and done" situation since the value of a location may change based on the grid's demand at any given time. VEIC mentioned that DER value can also vary greatly from feeder to feeder and any calculation done would be an iterative process. Thus, the goal of the study should be developing the approach/ process for calculating the value of DER – not conducting a one-time calculation in order to assign a static value of DER resources at certain locations. Pepco also raised that for a value of DER study to be impactful, a value of the grid study would also be needed. Stakeholders supported this notion and DOEE agreed to this addition of a value of the grid analysis to its proposal.

Finally, it was discussed that value of DER discussions have taken place at the jurisdictional level. New York and California were both referenced for their methodologies and being first movers in tackling this concept. Additionally, DOEE referenced a recent presentation made by Quanta at the 2019 Distributech Conference that highlighted a value of DER methodology for consideration. This presentation was posted to the WG3 workspace site for access by all working group members. These methodologies could all serve as starting points for the study envisioned for the District. It was noted in the discussion by various parties that the Value of Solar studies done in a variety of jurisdictions had resulted in extremely wide range of values and were highly subject to the particular perspective of the designer. It was additionally noted by stakeholders that a comprehensive value of DER and value of the grid study could be a significant effort and thus expensive to undertake. There was concern among the stakeholders of this expense being borne by ratepayers and if using MEDSIS funds was the optimal use of that limited budget. Similarly, Sunrun cautioned the WG3 stakeholders not to over-engineer the value of DER concept and noted the long duration and significant expense that has gone in to the NY value of DER proceeding. Sunrun's point was that if there is not a significant issue with current policy or NEM in DC then significant cost should not be allocated to a value of DER study.

The WG3 stakeholders recognize the inherent complexity of a locational value of DER and value of the grid study. WG3 does not have the technical capabilities, time or budget to complete such a study as part of the MEDSIS working group process. For this reason, the WG arrived at a recommendation for the DCPSC to initiate this study as part of the next phase of MEDSIS. The WG3 stakeholders further recommend:

1. The study scope include a value of the grid assessment. This would not be a full system assessment but focus on the value of the grid as an enabling platform for DER.
2. The consultant be selected via a competitive bid process using a selection committee and formal scoring process to recommend three proposals for DCPSC final decision.
3. Once the consultant is selected, WG3 members should be provided a meaningful opportunity to provide input regarding the scope of the study.
4. The study itself should be conducted independently by the consultant with results submitted directly to the DCPSC. MEDSIS stakeholders could then offer comments on the submitted report.

The study should include a literature review of other value of DER initiatives/ studies and should incorporate the work already done in the OPC and DOEE's Value of Solar Study. As such, the study should not be invented from scratch as there are several methodologies that have already been proposed in other jurisdictions and by experts that the consultant should draw from (e.g., NY DPS, CA PUC, Quanta).

5.3.2.3 Stakeholder Positions

A. AOBA supports this recommendation.
B. DCCA supports this recommendation. This study would produce a methodology that would inform the Benefit-Cost Analysis (BCA – Recommendation 5.1.2). The BCA methodology would not be complete without the Value of DER and Value of Grid output, and both methodologies should use the Metric for Evaluating Carbon Footprint Impact of DER Projects (Recommendation 5.1.1). These should therefore be done either as one piece, or sequenced (overlapping and coordinated in substance) so that the BCA methodology – which encompasses the other two – is completed last, with the benefit of the findings of the other two.
C. DCSEU supports this recommendation.
D. DCSUN supports a locational value of DER study however the scope of the study should be made clear to stakeholders prior to conducting it. However, DCSUN also supports Sunrun's qualification: "if there is not a significant issue with current policy or NEM in DC then significant cost should not be allocated to a value of DER study."
E. DOEE supports this recommendation and recommends that a study cost no more than $500,000. Response to Stakeholder Objections: A Value of DER study is a critical piece to design an appropriate regulatory framework for incentivizing DER integration in a way that provides the greatest benefit to the existing grid. DOEE hoped that the outcome of this working group would have included a proposed valuation framework for DER. The "value of the grid" is implicit in any framework that measures the value of DER, and therefore a separate study of the "value of the grid" is not needed. This is because the locational value of DER framework will show that a particular DER, based on location and time, either adds value (positive compensation for DER) to the grid, or takes service from the grid (positive compensation for the grid). DOEE also notes that the rate design working group should have provided meaningful evaluation of three items: customer-facing rate design to send appropriate market signals to influence behavior; utility incentives, and DER incentives. The working group spent most of its meetings discussing PIMs and performance-based ratemaking from Pepco, but hardly any attention was given, despite DOEE objections, to thinking about market signals for more accelerated deployment of DER, which is a key objective of MEDSIS. Ideally, this working group should have developed concrete suggestions for market signals that would result in greater deployment of DER, but this work was not done. This is the reason that DOEE found it necessary to suggest that PSC perform this study of locational value of DER framework, due to the lack of progress made by the working group on developing concrete suggestions for sending appropriate market signals to enable greater deployment of DER.

F. EEI opposes the recommendation. First, EEI would like to note that the summary of this recommendation does not acknowledge that there are methods of compensating DER that do not require a value of DER study. Simple tariff structures are used across the country to compensate power producers for the energy they provide.

   A value of DER study would be a costly endeavor—likely costing more than $500,000 (according to consultants that have done this work)—if it includes a locational value component, which is the stated reason DOEE suggested the study.

   Calculating "actual, calculable" locational benefits is a laudable goal, but, to date, has not actually been accomplished. In fact, it is worth considering that, of the efforts to study locational value of DER that have been conducted (NY, CA, MD, TX, OR) as part of "value of" analyses, none of these have a successful model for calculating locational value.

   Finally, EEI would like to acknowledge that value of DER—like value of solar—efforts often try to include unquantifiable benefits within the compensation structure. EEI disagrees with this approach, as it does not believe in compensating resources for speculative benefits that have no market or market-based proxy. Commissions across the country have agreed with this approach and have systematically eliminated climate, health, and societal benefits from inclusion in ratemaking – in part because these elements are inherently speculative, but also because utility-scale resources with the exact same attributes as DER are not awarded the same benefits.

   However, should a study still be called for by the Commission, EEI supports a "value of the grid" assessment, as any value of DER does not exist without an enabling grid on which to deliver said value.

G. General MicroGrids supports this recommendation, but would urge taking an integrated approach – recognizing the need to develop a grid that can integrate DER/Microgrid resources. This study should take into account existing models such as CA's and NY REV's. The CA Model addresses uniform, consistent and verifiable methods for capturing the value of DER/Microgrids; evaluates limits on the ability of DER to provide benefits and also evaluates Distribution System Operational and Infrastructure Capability to enable DER and Microgrid-provided value. GMI also recommends that the Study distinguish between "value of resource" and "value of services" methodologies and support and focus on the development of a "value of services" methodology.

H. Grid 2.0/DC CUB/ Sierra Club support this recommendation. A value of DER methodology is an essential analytical tool for understanding where DER and NWA can provide the greatest value to the distribution grid. It should be understood to complement load and power constraint study as a means for identifying priority NWA installations. As such this is a critical planning tool for integrated resource and distribution planning.

I. GRID Alternatives Mid-Atlantic conditionally supports the recommendation but recommends revising the background discussion ("WG3 stakeholders further recommend" #3) to clarify that stakeholders beyond those who were actively involved in WG3 should be provided a meaningful opportunity to provide input at the outset regarding the scope of the study, as well as offering comments on the submitted report. GRID agrees with DCCA that this recommendation should be implemented in alignment with recommendations 5.1.1, on carbon footprint impact, and 5.1.2, on benefit cost analysis.

J. Gridwise Alliance supports the recommendation and appreciates Sunrun's concern over cost and over-engineering the study. Gridwise also feels progress could be made on this topic more cost effectively by reviewing the substantial work that is being done by the DOE Grid Modernization Initiative through various U.S. Department of Energy National Laboratories.

K. NCS conditionally supports the recommendation but recommends revising the background discussion ("WG3 stakeholders further recommend" #3) to clarify that stakeholders beyond those who were actively involved in WG3 should be provided a meaningful opportunity to provide input at the outset regarding the scope of the study, as well as offering comments on the submitted report. New Columbia Solar also encourages the commission to consider the recently completed OPC value of solar study as a baseline for solar energy value.

L. OPC supports the recommendation with a clear scope and a firm cap is established that should not exceed $500k.

M. Pepco opposes this recommendation for the following reasons:

    a. Value of DER/Value of Grid studies are highly subjective as has been illustrated by the wide range of values assigned to solar, for instance. In the same month, Value of Solar studies in Montana and Maryland assigned values to solar of $0.035/kWh and $0.41/kWh, respectively.

    b. Because of the subjective nature of these studies, a Value of DER/Value of Grid study in the District would more likely result in contentious Commission proceedings than in increased DER adoption. This likely outcome was illustrated in New York where the use of a particular value of DER measure, locational system relief value (LSRV), had to be abandoned due to stakeholder disagreement.

    c. The likely high cost of performing a Value of DER/Value of the Grid study is not an effective use of MEDSIS pilot funds.

    d. An effective proxy for a Value of DER study will be the learnings obtained from the competitive market responses from DER developers to Pepco's NWA RFPs under the proposed DSP and NWA consideration process. Rather than spend limited MEDSIS pilot funds on a subjective and theoretical analysis, Pepco recommends that analysis of the competitive

bids received in response to NWA RFPs be undertaken so that a District-specific, locational value of DERs can be developed

N. Sunrun conditionally supports this recommendation. Sunrun supports efforts to identify and unlock the full value of DERs, but the usefulness of such a study must be weighed against other MEDSIS goals and projects given that it would consume MEDSIS funding. In addition, the proposed "value of the grid" study is unnecessary given that PEPCO is bound by the traditional cost-of-service regulatory model.

O. Tracy Warren conditionally supports the recommendation if it includes a "value of the grid" analysis. The information provided by such a study could enable better coordination between the utility, third-party developers and customers. Warren also supports Pepco's proposal for an analysis of the competitive bids received in response to the NWA RFPs as a proxy or as a first step. The City Council has set approved a plan that encourages distributed energy resources in the context of meeting climate change goals; a robust DER market should not be an end in itself. It is incumbent on those responsible for implementing the city's plan to ensure the proliferation of DER benefits the grid and consumers, as well as the environment.

P. WGL Energy supports this recommendation.

5.3.3 LEARNING – PERFORMANCE BASED REGULATION (PBR) IN THE DISTRICT

5.3.3.1 Background

WG3 spent multiple meetings discussing PBR and its potential applicability in the District. Industry experts from Brattle and the Regulatory Assistance Project (RAP) provided education on the difference between traditional rate design and PBR as well as insights into PBR treatment around the country. Numerous studies and papers have been presented through the years on what PBR is and what it is not and both Brattle and RAP engaged the working group in these discussions. Both made the point that all regulation is "incentive regulation."

RAP further explained that traditionally, regulatory incentives focused the utility on growing its rate base, increasing sales and electricity usage, and cutting non-capital expenses (as examples). More recently jurisdictions have been investigating PBR as a mechanism to provide directional goals and operational incentives that align utility performance with the jurisdiction's goals around sustainability and integration of renewables (as examples). RAP's presentation also covered multi-year rate plans, noting potential benefits including reduced frequency of rate cases and strengthened incentives for improved utility performance. RAPs overall conclusion was that PBR provides a framework where more focus can be put on outcomes and less focus on inputs (costs).

RAP further educated the working group by explaining that performance incentive mechanisms (PIMs) are a component of PBR that adopt specific performance metrics, targets, or incentives to affect desired utility performance that represents the priorities of the jurisdiction. However, with the exception of the UK RIIO model, very few jurisdictions have moved to full PBR from cost-of-service. In states where PBR has been implemented, that implementation has been a gradual process. The transition often starts with a small number of programmatic PIMs. PIMs can be set up as incentives, penalties, or for tracking/ reporting purposes only. Figure 5.6 highlights this continuum graphically.

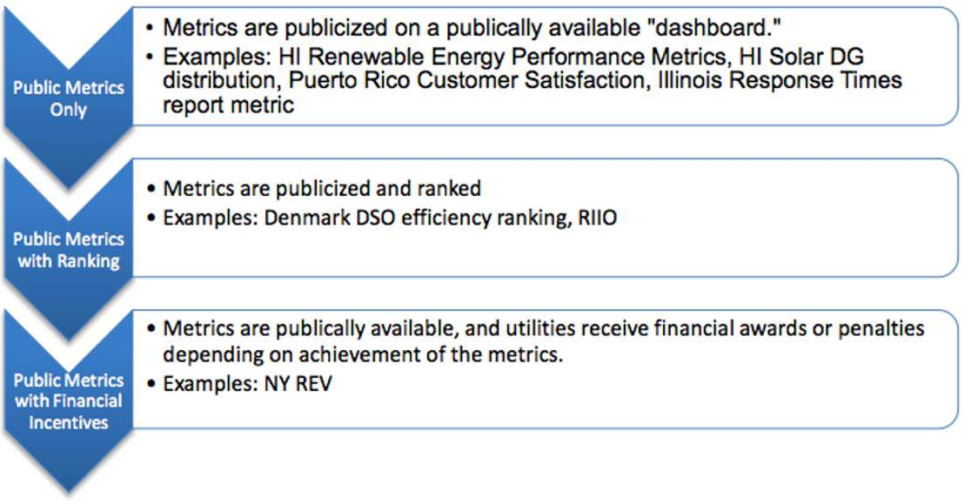

Figure 5. 6 – PIM Metrics Continuum

Credit: Regulatory Assistance Project

Over time, the PBR model can be evaluated and updated to move further from cost-of-service to more incentive based compensation through the addition of more PIMs and more incentive and penalty based compensation opportunities for the utility.

To supplement the input provided from industry, Pepco shared information they had received from Brattle describing PIMs as measuring more traditional utility outcomes such as safety, reliability, customer service, or even EE program participation versus emerging PIMs being used to measure evolving utility operations around AMI utilization, DER interconnection, beneficial electrification, and affordability. In addition to this broader industry background, Pepco provided information on their thinking around PBR resulting from separate PBR workshops they had conducted in parallel with the MEDSIS working groups. Pepco further indicated the PIM discussions conducted by WG3 was helpful input to their separate work on PBR.

The working group also heard specific examples of PBR implementation experiences from Consolidated Edison (ConEd) in New York where PIMs were introduced as

earnings adjustment mechanisms (EAMs) that could be positive or negative. In ConEd's case, both outcome and program based PIMs were established as indicated in Figure 5.7 below.

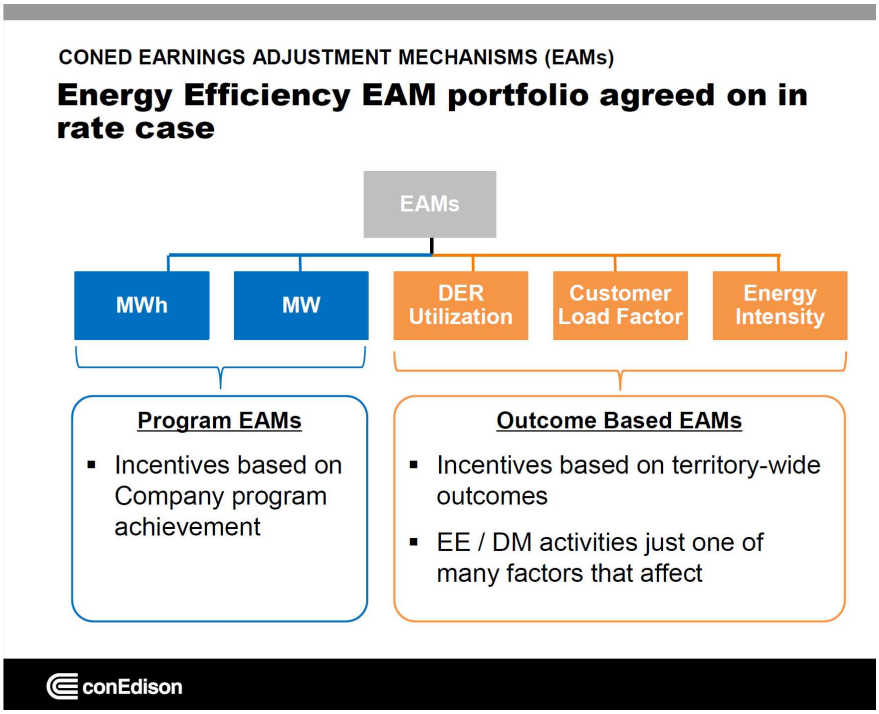

Figure 5. 7 – ConEd Program and Outcome Based EAMs

Credit: ConEd

Outcome based PIMS were those associated with achieving a desired outcome throughout the territory such as DER utilization whereas program based PIMs were based on ConEd specific program driven results. As of the date of their presentation, ConEd had only been able to realize positive financial impacts from programmatic PIMs and not from outcome based PIMs. Key lessons learned from ConEd's experience was to focus on a handful of metrics that are easy to understand and measurable, engage stakeholders early in the process to understand perspectives and areas of alignment, and ensure the internal organization is aligned with objectives.

The Rhode Island PSC Staff also presented on their experience with PBR and PIMs with National Grid. In their case, a detailed list of PIMs were initially proposed by National Grid. These PIMs were agreed upon through a consensus settlement between the utilities and the intervening parties. In large part, the Rhode Island PUC disapproved the settlement and only approved a small number of PIMs for tracking purposes only.

Part of Rhode Island's reasoning for this was recent performance incentive policy stating any incentive design should not duplicate incentives, not provide multiple

incentives for attaining the same objective, and not provide different incentives for attaining the same goal. According to the RI staff presenter, the Rhode Island PUC's issues with the PIMs presented was that either the existence of net benefits wasn't proven, it wasn't proven that customers would receive most of the benefits, in some cases the utility was already meeting or exceeding the target, there was not a connection between utility actions and the metric measuring performance, or there was already an incentive for action in place. Several MEDSIS stakeholders noted that this decision effectively penalized the utility for being an early adopter and did not create an environment in which the utility is willing to risk taking innovative actions until a clear incentive mechanism has been articulated.

To supplement these presentations provided during WG3 meetings, various industry reports on PBR implementation were shared with the working group for reference and background educational purposes. A listing of these reference documents is provided as Appendix A.7 of this report.

WG3 stakeholders considered all this input in a discussion of PIMs that occurred over multiple meetings. It was acknowledged that while PIMs are a key component to PBR, they must be properly designed to support both a financially healthy utility and drive outcomes consistent with the MEDSIS vision and with District energy and sustainability goals. PIMs could be created to measure performance against both traditional (e.g., reliability) and emerging (e.g., sustainability) outcomes. These PIMs could be both outcome (e.g., reduction in CO2 Equivalent as measured by factors under the utility's control) and programmatic based (e.g., number of customers registered in a certain utility program). The decision about what data is used to measure performance should be backed by strong stakeholder consensus.

Figure 5.8 below shows the relationship between goals, outcomes, and metrics associated with PIMs.

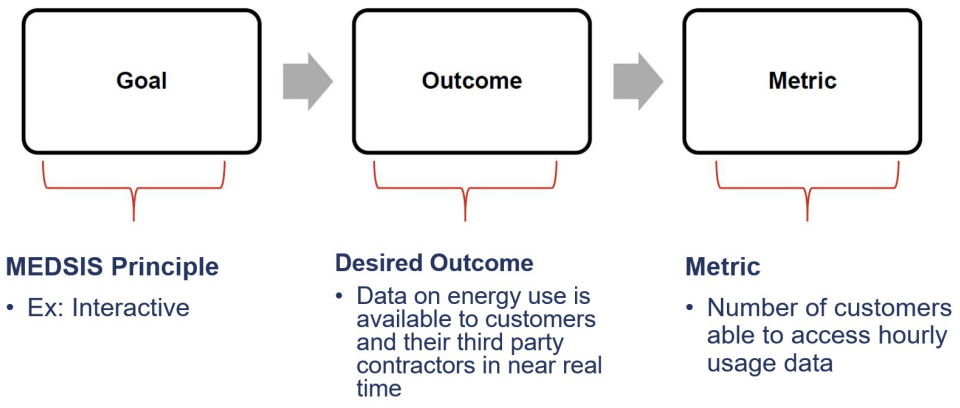

Figure 5. 8 – PIM Development Process

Credit: WG3: Rate Design November Meeting

To facilitate stakeholder comments and further input on the PBR topic, the working group engaged in a survey around PBR transition options as well as a survey around PIMs, both traditional and emerging, and how they might help move the District toward the MEDSIS vision.

These surveys helped document that WG3 stakeholders were largely favorable toward PBR but felt any transition to PBR that might occur in the District should occur gradually over time. They also identified a wide range of potential PIMs that working group members were interested in as potential measures of utility performance in achieving both emerging District policy goals (e.g., sustainability, etc.) as well as more traditional core utility operational goals (e.g., safety, reliability, etc.).

To consolidate the working group's brainstorming efforts around PBR and PIMs, the working group engaged in an exercise of mapping the MEDSIS Principles to a set of potential PIMs as a way of understanding which would be most consistent with the MEDSIS vision (see Table 5.9). The table is a brainstormed list of potential PIMs and it should be noted that almost every other jurisdiction implementing PIMs started with a short list of PIMs that could be easily measured and tied to utility performance. Additionally, the working group has recognized that PIMs could also be designed to drive very targeted outcomes such as increased energy efficiency by customer segment or at specific locations of grid constraint.

Principle	Potential Outcome (Emerging or Traditional)	Potential Metric (Program or Outcome)
Sustainable	DER deployments are increased (for locational value) **(E)**	• Total MW of DER Installed **(O)** • # of DER deployments **(O)** • Timeline for interconnection **(P)** • Hosting Capacity map update frequency **(P)** • Hosting Capacity data granularity **(P)** • Use of Smart Inverters **(O)**
	Reductions are achieved in carbon equivalent emissions and other air pollutants in a cost effective manner **(E/T)**	• CO2 equivalent avoided per kW/kWh through DERs **(P or O)** • Natural Gas leakage metric **(P and O)** • Clean MWs at peak **(O)**

Principle	Potential Outcome (Emerging or Traditional)	Potential Metric (Program or Outcome)
	EV charging and deployment leads to a) greater grid utilization rate, b) peak reduction, and c) reduced carbon emissions associated with the grid **(E)**	• # of chargers installed **(P)** • Charger utilization **(P or O)** • EV TOU Rate Opt-In % **(P)** • Cumulative KWh of off peak charging (O) • KWh of EV battery discharge at peak (O)
	Carbon equivalent reductions achieved from energy efficiency is increased **(E)**	• Conservation voltage reduction (CVR)/ System optimization % **(O)** • Demand Response kW under Control **(P)** • kWh or BTU reductions **(P)** • kW reductions **(P)**, or carbon equivalents • Targeted EE programs **(P)** (e.g., load reduction by date at certain location)
	System utilization is optimized	• Capacity factor (O) or System Load Factor (O)
Well-Planned	Load management is included in a distribution planning process that is inclusive and transparent, utilizes the existing system cost effectively, and identifies opportunities for alternative solutions that defer capital investment **(E)**	• Peak MW reduction **(O)** • EV managed charging **(P)** • DR program MWs under control **(P)** • Dynamic pricing program participation **(P)** • Clean MWs at peak **(O)** • Best cost-benefit ratio among alternative solutions **(O)** • **Utility load factor (O)**
	Customers, including low income customers, have increased access to a wider range of utility and third party services **(E)**	• # of LI DER installations **(O)** • LI EE Behavioral kWh **(P)** • LI EV ride/car share participation **(P)** • # of customers participating in energy management programs **(P or O)**

Principle	Potential Outcome (Emerging or Traditional)	Potential Metric (Program or Outcome)
	New, proven technologies are more easily integrated into the District's delivery system **(E)**	• Total MW of DER installed **(O)**, • # of DER deployments **(O)**, • Timeline for reliable interconnection **(P)** • Hosting Capacity map update frequency **(P)**
Safe & Reliable	High levels of reliability are ensured **(T)**	• SAIDI **(O)** • SAIFI **(O)** • CEMI **(O)** • Future IEEE 1547-2018 Reliability Metric **(P)**
	Resiliency of the grid is increased **(E)**	• New suggestions for Resiliency Metrics being provided by DOEE and Pepco
Secure	High levels of reliability are ensured **(T)**	• See metrics under Safe & Reliable
	Financial integrity of the utility is ensured **(T)**	• Cost savings from multi-year rate plan **(O)**
	Resiliency of the grid is increased **(E)**	• See metrics under Safe & Reliable • Cyber security exercises completed **(P)**
Affordable	Load management is included in a distribution planning process that is inclusive and transparent, utilizes the existing system cost effectively, and identifies opportunities for alternative solutions that defer capital investment **(E)**	• Cost benefit evaluation of EE and DER/ NWA options **(O)** • See Well-Planned metrics
	Customers are ensured access to basic electricity service that is affordable **(E)**	• $/KW baselined to industry average **(O)** (excluding taxes, fees, fuel costs)
	Energy efficiency is increased consist with DC Clean Energy goals **(T)**	• kWh savings by program **(P)** • LMI participation in EE programs **(P)** • See Sustainable metrics

Principle	Potential Outcome (Emerging or Traditional)	Potential Metric (Program or Outcome)
Interactive	Key data is accessible by qualified stakeholders to make efficient decisions	• Public online portal established for non-sensitive energy and usage data (O) • Timely access to above data with customer protections as agreed upon through stakeholder process (O) • Pepco implementation of a certified version of the Green Button Connect My Data .service
	System and usage data is made available to third parties and customers in a timely fashion	• Time to provide customer usage data once requested (O)
Non-Discriminatory	Customers, including low income customers, have increased access to wider range of utility and third party services **(E)**	• Geographic distribution of services provided/sold/offered (O)
	Customer satisfaction is increased **(T)**	• Customer satisfaction survey as a trend/ratio of current over 5 yr. running average (O) • Annual survey data show increase in customer satisfaction **(O)**, with survey designed through stakeholder process. • Improved Customer call response time **(O)** • Higher than required results on performance standards SAIDI/SAIFI (etc.) **(P)**

Table 5. 9 – MEDSIS PIM Mapping Summary Table

Other MEDSIS working groups also discussed establishment of PIMs. The Customer Impact Working Group (WG4) concluded that if PBR moves forward in the District, a performance metric around customer data access should be considered. Similarly, the NWA Working Group (WG2) discussed utilizing PIMs to measure Pepco use of NWAs to traditional capital infrastructure investments. WG3 stakeholders struggled with metrics to establish for resiliency based outcomes. Both DOEE and Pepco expressed interest in helping to define such metrics but were not able to provide this input in time for inclusion in the report.

WG3 suggests the DCPSC look at the PIM Mapping exercise materials referenced in Table 5.6 for guidance on the working group's thinking around PIMs. This would serve as a good starting point for the Commission when it begins to investigate potential PIMs in the future. What might not be obvious from the mapping document is the challenge of creating PIMs in alignment with MEDSIS principles that can be in natural conflict with one another. For example efforts that improve Reliability may be in conflict with Affordability. Similarly, efforts to ensure the grid is Safe and Secure, may be in conflict with ensuring it is Interactive. This speaks to the challenge in designing PIMs that drive the correct desired outcomes.

In conclusion, a great deal of investigation into PBR was conducted by WG3. In these discussions stakeholders including Grid 2.0, DOEE and Pepco were largely in favor of a PBR recommendation because of the positive endorsement for PBRs espoused by guest speakers and the overall potential PBR offers in tying utility performance to District goals. Grid 2.0 had specifically recommended PIMs as a mechanism that could align Pepco's performance with increased use of DERs as non-wires alternatives. Pepco, meanwhile, was open to the concept of PIMs especially those designed to offer Pepco financial incentives rather than just penalties as is currently the case with their merger commitments and quality of service metrics. DOEE was interested in utilizing PIMs tying utility performance to emerging District clean energy goals for initial tracking and reporting purposes. However, OPC felt strongly it was pre-mature for WG3 to make any recommendations around PBR because Pepco would soon be submitting a new rate case and because WG3 had only talked about PBR concepts and not specific details. Additionally, while WG3 did a lot of brainstorming work around PIMs and their hypothetical applicability in the District, the PIM mapping exercise in and of itself was not to the level of detail required to support a recommendation around specific PIMs to incent utility performance in the District.

5.3.3.2 Conclusion

The following Learnings related to PBR are offered for Commission consideration:

1. Transition Approach – If considering PBR, the DCPSC should plan a gradual transition that initially maintains elements of cost-of-service while incorporating PBR constructs including an initial small number of well-designed PIMs.
2. PIM Design – Careful consideration should be made to construct PIMs that align utility performance with District goals. Attention should be paid to development of PIMs that measure both traditional and emerging measures. Outcome or programmatic PIMs can be effective if tied to factors the utility can influence and should be symmetrical (incorporate a financial penalty and incentive).

5.3.3.3 Stakeholder Positions

A. CRDC does not offer a position but states "…that Pepco's business model should be reformed to align…" with "…the end state required (an open ecosystem) to achieve the District's goals and work backwards to reform the

utility business model in a thoughtful, creative way that aligns with the goals of maximizing innovation, economic development, equity while minimizing ratepayer impacts."

B. DCCA believes that setting rates based on a Return on Equity target motivates the utility to achieve its energy distribution goals in a more capital-intensive way than necessary. This basis for rate-setting rewards shareholders for over-use of capital, boosting the costs that consumers must pay. Can Performance Incentive Mechanisms (PIMs) change this? Is it possible to design PIMs that effectively remove the incentive to over-invest? This is a critical challenge, arguably as important as any other objective. The Commission should address this challenge as a matter of high priority.

C. DCSUN recommends that this learning be converted to a recommendation to the DCPSC. The working group spent significant time discussing PBR and its applicability in the District and agreed that PBR should be implemented in the District, albeit "thoughtfully and over time." Further, this recommendation does not mean that PBR will be implemented immediately and discussions around performance incentive mechanisms will be ongoing.

D. DOEE supports this learning and could eventually support this learning being converted to a Recommendation. However, DOEE understands that there may be implications for turning this into a recommendation at this time given that Pepco is expected to make a PBR filing. DOEE further commented that "PSC should outline the policy goals of PBR that would further the MEDSIS vision. Discussing any specific PIMs could potentially interfere with the anticipated Pepco's MYR filing, but DOEE suggests that PSC consider the use of "tracking" PIMs (i.e. without any monetary incentives or penalties in the first round) to provide the time for Pepco to collect data and gain experience, and that priority be given to PIMs that address new activities, especially ones involving adequate compensation for implementation of NWAs and moving away from capital expenditure bias." DOEE believes PBR is needed to align the financial interests of Pepco with the climate change goals and DER-driven projects. PBR can be an effective tool in shifting the incentive away from a capital bias and toward incentivizing new activities (renewable energy interconnection, data-sharing, distribution-level markets, etc.) Ultimately, DOEE suggests that PBR be used to help turn the grid into a technology-neutral platform. For more information on grid-as-platform, DOEE notes it agrees with HECO's view of the Grid as a Platform, which was proposed in August 2017.

E. EEI acknowledges this learning and believes there is value in further exploring PBR. However, EEI believes caution should be taken when considering Performance Incentive Mechanisms, as "programmatic PIMs" and "outcome-based PIMs" are entirely separate efforts. The latter depends on factors outside of the utility's control, therefore making "success" a difficult task. Additionally, EEI believes other states and jurisdictions should be evaluated before proceeding with PBR or PIMs, as there are many places to gather knowledge and lessons learned beyond New York and Rhode Island.

F. Grid 2.0/DC CUB/ Sierra Club opposes this learning. Grid2.0/DCCUB/Sierra Club do not support this area of investigation being termed a "learning" in contrast to a recommendation. We recommend that WG#3 members who wish to develop PBR concepts such as PIMs further for future PSC consideration - including the expected 2019 Pepco rate request, self-select and continue working together collegially as a formally recognized FC 1130 PSC workgroup to explore the feasibility of different ratepayer and utility facing rate designs.

G. Grid Alternatives Mid-Atlantic/ NCS generally support this learning.

H. Gridwise Alliance does not offer a position but references their ongoing support, via filed comments with the NY PSC, of MYRPs in NY.

I. OPC was present during the learning session and actively participated in the WG session. Pepco will be filing a rate case with PBR, thus OPC cannot take an official position on this learning.

   OPC further notes that MYRPs come in many different designs. OPC further states they do not recommend including a broad recommendation on PBR or MYRPs in MEDSIS without knowing the details of the Pepco's proposal to be filed May 2019. OPC's concern is to prevent the possibility of severe negative consequences for consumers from such proposals without an opportunity to fully review. Furthermore, OPC recognizes the need for methodologies that would help evolve customer rate design and utility ratemaking to advance modernization initiatives while still maintaining affordable rates and the continued provision of safe, reliable energy services for District ratepayers and consumers. While it was helpful to learn more about the how policy experts and other jurisdictions are approaching the evolution of customer rate design and utility ratemaking to advance modernization initiatives, OPC believes that the working group did not have the necessary conversations to develop specific recommendations for the Commission's consideration

J. Pepco acknowledges this learning and agrees that a transition to PBR should be a gradual one, in which cost of service ratemaking forms the foundation, and a limited number of PIMs are introduced initially. Pepco also agrees that PIMs can and should align utility financial performance with the District's goals. PIMs should be based on metrics the utility can influence, and incentives should be symmetrical (i.e. both rewards and penalties).

K. Tracy Warren supports the Learning. Warren supports exploring changes to the rate design and the rate-making process that will allow for innovation -- particularly innovations that could benefit the city's low- and moderate-income residents. Concerns about the negative impacts on consumers should be a guard rail, not a roadblock to changes that could unlock benefits for these District residents. WG3's discussion of PIMs, however, revealed that a lack of reliable data and agreed-upon metrics for measuring performance presents a significant obstacle to implementing PBR. Warren agrees with Pepco that PIMs should be

limited to metrics the utility can reasonably influence through its operations. Warren does not believe penalties are necessary or useful.

5.4 Customer Impact

5.4 Customer Impact							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.4.1	DCPSC to Enhance and Consolidate Customer Education Materials				x	x	
5.4.2	DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers				x	x	
5.4.3	DCPSC to Work with Pepco to Enhance Customer Data Access and Protection	x			x	x	
5.4.4	DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments				x	x	
5.4.5	DCPSC to Enhance Customer Participation in Low-Income Programs	x			x		
5.4.6	DCPSC to Revise the CBOR to Support the MEDSIS Pilot Projects Phase				x	x	
5.4.7	Learning: Opportunity for Resilience Hubs in the District	x	x	x	x	x	x
5.4.8	DCPSC to Ensure Connection Between Customers' Energy Usage and their Environmental Impact			x	x		

Table 5. 10 – WG4: Customer Impact Recommendations and Learnings

5.4.1 RECOMMENDATION – DCPSC TO ENHANCE AND CONSOLIDATE CUSTOMER EDUCATION MATERIALS

5.4.1.1 Recommendation

WG4 recommends the DCPSC consolidate energy educational material along with information on MEDSIS in one place on their website. This information should be easy to access and use with links provided to complementary information on the appropriate pages of the DOEE, DCSEU, Pepco, and OPC websites. This information should be supported by clear, consistent and persistent communications to consumers.

5.4.1.2 Background

In the October 2018 Customer Impact working group meeting, the subject of customer education and engagement was discussed. Guest speakers from OPC, Pepco, Oracle, Arcadia Power, and the American Coalition of Competitive Energy Suppliers (ACCES)

all presented their perspectives on the importance of customer education. These presentations revealed that customers can be skeptical of information being provided in a marketing context and that customers may not always know where to find educational materials or know who to trust for this information. A variety of organizations are providing information such as Pepco, OPC, the PSC, and DOEE, as are third parties offering new services to District customers. This may create confusion and uncertainty with customers on what information is correct and who can be trusted.

OPC in their presentation highlighted the role in addressing customer complaints. From this experience they explained that District customers fall into one of the following three informal categories:

- Legacy Consumer
- Present Day Consumer
- Consumer of the Future

Treatment of these customers regarding education and marketing should differ. Legacy Consumers tend to be largely focused on matters of affordability whereas Consumers of the Future may be more interested in advanced energy services. Legacy Consumers may not have Internet access or may just prefer paper communications whereas Consumers of the Future will want to do much of their transactions within technology based communications applications.

To ensure equitable access to this information, the DCPSC should consider opportunities to engage with all customer groups: Legacy Consumers, Present Day Consumers, and Consumers of the Future. Providing educational material can be challenging but needs to address all these consumer groups "where they are." Educational material should not be developed with the intention of moving consumers across these customer groups (e.g., such as moving a Legacy Consumer to a Consumer of the Future), but should be developed to create value for each category of consumer and thus enable them to move themselves to the next category if so desired.

5.4.1.3 Stakeholder Positions

A. DCCA conditionally supports this recommendation. Add Washington Gas to "links provided to complementary information on the appropriate pages of the DOEE, DCSEU, Pepco, and OPC websites".

B. DCSEU supports this recommendation.

C. DCSUN abstains from stating a position.

D. DOEE supports the recommendation.

E. EEI supports this recommendation. District residents should have educational information readily available to them. In addition, customers should be able to access complementary information via links to DOEE, DCSEU, and OPC websites. EEI wants to ensure all customer categories have equitable access to this information.

F. General MicroGrids supports this recommendation.

G. Grid 2.0/DC CUB/ Sierra Club support the recommendation.

H. GRID Alternatives Mid-Atlantic supports this recommendation. Information on low- and moderate-income energy programs should be part of the consolidated information and educational material. GRID also suggests preparing and making available non-internet based educational material containing the same basic information, to reach customers who have less comfort with, or reliable access to, online information.

I. NCS supports this recommendation.

J. OPC supports the recommendation.

K. Pepco supports this recommendation, believes this should be funded with MEDSIS pilot funds and notes that Washington Gas and DCRA information should also be included.

L. Sunrun supports the recommendation.

M. WGL Energy supports this recommendation with the exceptions discussed below:

    a. WGL Energy previously submitted detailed comments on the need to provide consumers with more than just pricing information and that educating customers on retail choice and various options available from competitive suppliers empowers those customers to find and choose the best energy supply offers that meet their needs. These offers have economic value to the customer as well but are not reflected in the cursory price comparison between supplier prices and SOS rates. Most importantly, these offers allow customers to make the choices that best suit their lifestyles and needs.

    b. Another important issue is having current, up-to-date information on the utility bill that helps a customer currently receiving Standard Offer Service (SOS) to accurately compare their SOS rate to other offers from competitive retail suppliers. More specifically, and as currently displayed on the utility bill, the SOS customer is provided with the average annual price to compare (PTC) and can cross check this rate to competitive retail supplier prices. This average annual price to compare rate, however, is not reflective of the effective price to compare in a given month because it is the average annual price to compare for 1 year from June through May of the following year. Therefore, this information lacks the current, up-to-date PTC information in a given month that a customer needs when comparing it to retail supplier prices in that given month and offered for a longer, future period of time that most often goes beyond May of the following year when the current utility PTC changes. Providing customers

with current, up-to-date information in a given month will allow for a more accurate and transparent shopping experience

5.4.2 RECOMMENDATION – DCPSC TO CONSOLIDATE AND ENHANCE COMPETITIVE ENERGY SUPPLIER INFORMATION FOR DISTRICT CUSTOMERS

5.4.2.1 Recommendation

The DCPSC should create a new stand-alone website or enhance their existing website to house up-to-date competitive energy supplier offers as well as energy education material that would aid customers in evaluating offers. The new site should be easily identifiable and accessible from the DCPSC home page. A marketing campaign should accompany the availability of this new website to increase customer awareness of the site.

5.4.2.2 Background

As part of the Customer Impact Working Group's discussions on customer education and engagement during its October 2018 meeting, the group discussed retail access topics. Retail competition has been in place in the District for almost 20 years; yet, few residential customers have migrated to competitive electricity providers (only 14.6% of customers which represents 15.7% of total residential load)16. Meanwhile, non-residential customers have largely switched to a competitive supplier (35.6% of customers representing 82.4% of total commercial load)17. This is partially due to the targeting of commercial customers by competitive electricity suppliers. Commercial customers also tend to have more internal resources with energy expertise to evaluate competitive offers and can see more of a direct connection between their ability to shop for energy supply and their bottom line.

While many factors likely contribute to the lack of switching among residential customers, the group felt significant factors included the difficulty many District customers face in evaluating competitive offers and the shortage of trusted energy educational material that would help them evaluate offers. This lack of streamlined, readily available information in the District has likely contributed to residential customers adopting a "do nothing" approach.

During the October 2018 working group meeting, the American Coalition of Competitive Energy Suppliers (ACCES) presented on trends they see in the industry with respect to retail competition. ACCES indicated that, typically, 30% of a jurisdiction's residential customers would be open to switching suppliers if provided with the right information to help them make a decision. Another 30% would probably never consider switching

[16] Pepco's December 2018 Monthly Market Monitoring Report

[17] Pepco's December 2018 Monthly Market Monitoring Report

absent some sort of mandate. ACCES went on to say that Pennsylvania (PA) has been successful in educating their consumers through the PA Power Switch program[18]. While it has been expensive (the PA PSC has spent ~$9 million to streamline education), it has resulted in around 40% of customers switching to competitive suppliers. ACCES explained the Pennsylvania market and their experience from surveys conducted in other jurisdictions reveals that consumers want to be educated on energy topics. Other states with comprehensive shopping websites include Ohio, Maryland and Illinois.

OPC contributed to this conversation by explaining that residential customers have also been impacted by marketing techniques from competitive suppliers that, in some cases, have caused confusion and made customers skeptical of competitive offers. For example, some marketing brochures list all the example benefits but don't provide all the program details for the customer to evaluate. This has resulted in complaints being filed with OPC. Therefore, OPC felt a compilation of competitive service offerings in one location provided by a trusted source would be well received by customers.

5.4.2.3 Stakeholder Positions

A. Arcadia Power opposes with alternative recommendation: We believe that a shopping website that doesn't allow all registered service providers to participate will lead to negative outcomes for consumers. Specifically, brokers and aggregators can frequently help customers find rates that are lower than rates published by suppliers on a shopping site. Restricting content on the site to "supplier offers" is arbitrary and will harm customers.

   To address this shortcoming, we suggested that the following sentence be added to the recommendation: "The website should also include space for brokers and aggregators to market their services, including the ability to find supply rates that are cheaper than published offers."

   We believe this suggestion was not accepted due to a misinterpretation of working group process rules on the part of the facilitator and another working group participant, and are disappointed to have to oppose the final wording of the recommendation.

B. DCCA supports the recommendation conditionally. Education around comparing energy suppliers should be guided by the goal of enabling cleaner power as well as affordability for customers. Thus, the website should focus on emissions as well as affordability factors.

C. DCSEU supports this recommendation.
D. DCSUN abstains from stating a position.
E. DOEE supports this recommendation.

[18] https://www.papowerswitch.com/

F. EEI supports this recommendation and supports the creation of an easily accessible website similar to PA Power Switch dedicated to housing competitive supplier information in addition to educational materials to assist consumers with their purchase.

G. General MicroGrids supports this recommendation.

H. Grid 2.0/DC CUB/ Sierra Club support this recommendation.

I. GRID Alternatives Mid Atlantic/ NCS support this recommendation. We suggest that the “energy education material that would aid customers in evaluating offers” include information on the environmental and health impacts of various energy supply sources, not just rates.

J. OPC supports the recommendation and encourages the PSC to share the link with other government agencies so clear messaging and marketing surrounding MEDSIS.

K. Pepco supports this recommendation and believes this should be funded with MEDSIS pilot funds.

L. Sunrun abstains from stating a position.

M. WGL Energy fully supports the development of a shopping website that properly displays competitive product information beyond simply price and enables customers to fully review competitive offers in the District of Columbia; a site that includes educational material and the execution of a marketing campaign to raise awareness of the site. While WGL Energy understands that if granted approval by the Commission, that the mechanics and costs of developing a shopping website would be fully examined at a later date and therefore WGL Energy will not provide detailed feedback on that matter in this forum. However, WGL Energy does want to highlight the critical importance of ensuring that in such a discussion, guidelines be identified and developed for the chosen entity who is put in charge of updating and maintaining the website and guidelines for the entity in charge of ensuring the prices and relevant information is up to date and accurate. Such rules will help allow for a robust shopping website enabling customers to shop for product offerings that are accurately reflective of their price and services.

5.4.3 RECOMMENDATION – DCPSC TO WORK WITH PEPCO TO ENHANCE CUSTOMER DATA ACCESS AND PROTECTION

5.4.3.1 Recommendation

The DCPSC should direct Pepco to proceed with investigating the implementation of the Green Button Connect My Data (CMD)[19] functionality in accordance with standards established by the Green Button Alliance[20]. The DCPSC should review Pepco's existing data security standards for adequacy against the CMD standard. Further, the DCPSC should ensure third parties seeking access to customer data via an electronic interface with Pepco adhere to Pepco's cybersecurity standards for protection of this data. The DCPSC should have the authority to audit third parties' systems and processes to ensure compliance with these standards. Finally, the DCPSC should ensure utilities and energy service providers develop policies and practices to address the integrity and confidentiality of customer data and should ensure the information security of all interfaces, devices and operations involving customer data sharing includes but is not limited to the following:

1. An opt-out data sharing policy for aggregated data to protect customer privacy and personally identifiable information (PII)
2. An opt-in customer data sharing agreement for PII data

5.4.3.2 Background

Customer data access and protection provisions should be guided by the goal of maximizing benefits to all ratepayers including those not choosing to avail themselves of these services. A secondary goal is to encourage a competitive market for energy services that gives customers diverse options to meet this primary goal. This competitive market is enhanced by driving down barriers to customers' accessing their data and authorizing third parties to access their data.

Over the course of several meetings, the Customer Impact Working Group discussed how customer access to energy usage data is a key component to ensuring the grid in the District is Affordable, Interactive, and Non-Discriminatory. The working group heard from third parties providing competitive services directly to customers how important a streamlined and "frictionless" process for accessing customer data is to facilitating the market for these services. This was true for services targeted at both residential and commercial customers. The group also discussed the importance of protecting customer data from bad actors and ensuring a customer's privacy is protected.

The customer data access advocacy firm, "Mission:data," presented to the working group and provided an overview of the advancements occurring in the industry around

[19] https://www.greenbuttonalliance.org/assets/docs/Collateral/2018-08%20Green%20Button%20CMD%20and%20Certification%20Data%20Sheet.pdf

[20] https://www.greenbuttonalliance.org/

customer data access and protection. This presentation highlighted California's "click through" provisions as well as the advantages offered through the new Green Button Connect My Data (CMD) protocol versus the more standard Green Button Download My Data protocol. The presentations from Mission:data and third party service providers both highlighted the delicate balance utilities face in enabling a streamlined data access process with supporting tools and technical support against the need to ensure customer data is protected.

The District is in a good position, as regulations addressing customer data access and protection already exist. Pepco already offers a range of tools for both commercial and residential customers to access and leverage their data to make smart energy decisions. The working group does acknowledge that as the grid evolves, customers and end users will need real-time information on their load data and spot market-pricing to make energy use decisions and to evaluate services offered by Pepco and third parties. This will be especially true as DERs increase and alternative rate options, such as dynamic pricing or TOU rates, are enabled.

Most of the data needed for customers to make smart choices is already available on their online account with Pepco, including all billing information and usage information. Additionally, Pepco has implemented Green Button Download My Data (DMD) functionality allowing customers to download a flat file of their energy usage data. Many customers today are giving third parties access to this data via credential sharing. The working group determined the Commission should not make any changes to this form of data access. If the DCPSC does make changes, they should instruct Pepco to build a portal that replicates the ability for a customer to grant access to their online account to any third party. Existing data security protocols appear to be adequate for now, but it is best practice to regularly revisit these standards, especially at the current pace of change occurring in the utility industry.

Access to services offered by electric competitive suppliers and new third parties requires customer data to be made easily available to any entity to whom the customer wants it to be available. Competitive suppliers want to avoid overly complicated restrictions to this process. It appears that under current District law, once the customer makes their existing data available to a third party (no matter the method), the data is covered by relevant terms and conditions with the third party, existing contract law, applicable cybersecurity laws, and the threat of lawsuits (including class action lawsuits) to punish malpractice. This is different from a third party getting customer data directly from the utility which should receive DCPSC oversight. The USGBC's PEER[21] Scorecard on Data could serve as a model for these DCPSC policies in this area including policies around data confidentiality.

[21] http://peer.gbci.org/

5.4.3.3 Stakeholder Positions

A. Arcadia Power supports this recommendation, with two clarifications. This recommendation encourages Pepco to continue building a Green Button Connect tool, which will help third party companies provide better services to customers. We have two clarifications. First, Pepco should implement the entire Green Button Connect platform, including the "retail customer" schema that includes customer and billing information. Second, our understanding is that where the recommendation instructs the PSC to "ensure third parties seeking access to customer data via an electronic interface with Pepco adhere to Pepco's cybersecurity standards for protection of this data", the intent is for third parties to comply with a cybersecurity standard that Pepco has created for third parties to receive information, which is distinct from Pepco's internal cybersecurity standards for their own operations.

B. AOBA takes no position in support of or against the recommendation. It is AOBA's position that customer utility information must remain under the control of the customer and should not be released to any third party without prior written customer authorization. Furthermore, AOBA only supports "opt-in" permission for the release by Pepco to any third party of customer account information. In addition, every customer retains all federal, state and local legal and regulatory protections against unauthorized access to and use of their customer account information. Customer account information includes personal and energy consumption data for an account receiving service from a utility or third-party provider of utility services authorized by the customer to bill the customer for service.

C. DCCA supports this recommendation.

D. DCSEU supports this recommendation and notes that there is a process in place where DCSEU customers (commercial and institutional) can sign a Letter of Authorization Release Form that provides DCSEU access to energy usage data from both utilities. This data is considered confidential.

E. DCSUN abstains from stating a position.

F. DOEE conditionally supports and offers that "aggregated and anonymized (A&A) customer data should be useful to identifying EE and DR and other energy service opportunities."

G. EEI supports this recommendation.

H. General MicroGrids supports this recommendation.

I. Grid 2.0/ DC CUB/ Sierra Club support this recommendation, adding that "Greenhouse gas (GHG) generation metrics will be included so that D.C. customers can understand their utility GHG footprint, and allow them to compare and control their GHG emissions."

J. GRID Alternatives Mid-Atlantic/ NCS generally support this recommendation, and endorse the comments of DOEE and Grid 2.0/DC CUB/Sierra Club on the value of allowing customers to better understand their GHG footprint.

K. OPC supports this recommendation.

L. Pepco supports this recommendation noting that, in the event the Commission finds it cannot exercise authority over third parties, it should consider directing Pepco to execute NDAs with these third parties in order to give the Commission insight into and confidence regarding third party security and privacy standards and practices. It should be further noted that this NDA would in no way transfer to Pepco responsibility for a violation by or breach of a third party.

M. WGL Energy supports this recommendation.

5.4.4 RECOMMENDATION – DCPSC TO DIRECT PEPCO TO DEVELOP ENERGY EFFICIENCY PROGRAMS FOR MASTER METERED APARTMENTS

5.4.4.1 Recommendation

The DCPSC should direct Pepco to develop energy efficiency programs that encourage participation by residents in master-metered buildings. Incentive based programs would need to offer measures targeted at renters and whole building measures equally such that both landlords and renters benefit from these programs. Any program developed would need to be designed and implemented in coordination with energy efficiency programs offered by the DCSEU and other District organizations especially programs targeted at low income populations.

5.4.4.2 Background

As part of its discussions on customer data access and protection and needs of sensitive customer groups, the Customer Impact Working Group discussed the unique challenges and opportunities around master metered apartments. From a data access standpoint, there is very little Pepco can do to provide tenants of master metered apartments with their individual usage data as only the landlords have access to a building's meter data and it is a total building load. If tenants could view and track their individual electricity usage it could lead to changing behavior which, in aggregate, would significantly impact overall demand on the grid. Addressing the energy profile of master metered dwellings in this way would be important in helping the District meet its clean energy goals.

The challenge of master metered apartments is not unique to the District. Industry wide, utilities and energy efficiency service providers struggle with the "split incentive" issue which is explained as follows:

1. Rebate programs to implement energy efficiency measures can be targeted to landlords, but landlords often don't want to make the required capital investment or share the resulting savings with tenants.
2. Rebates on energy efficiency measures can be targeted to tenants, but building codes or rental agreements may prevent tenants from making the required modifications and tenants may not want to invest in such measures as all savings will be reflected in the landlord's electricity bill and often don't flow to residents in the form of reduced rent.

While not unique to the District, the master metered customer issue in the District is especially complex. Through information shared from the Rate Design Working Group (WG3), it was learned that, as of 9/30/2018 Pepco has 978 customers on a master metered apartment (MMA) rate. The rate is available to low-voltage electric service at apartment buildings where the use is primarily residential. The distribution rate includes a customer charge and a blocked seasonal kilowatt-hour charge. According to Pepco, approximately 54,352 units are behind these 978 meters. The residents of these ~54,000 units are not able to access their individual energy usage to make changes in their energy consumption in a way that directly impacts them financially.

WG3 discussed that around the country there are creative energy efficiency and financing programs being developed to address master metered apartments and the split incentive issue, but there is not one solution that works in all instances. The DOEE/DCSEU is conducting a pilot program on one approach to this complex issue designed to offer benefits to both the landlord and residents. While the pilot will not be complete until later in 2019, the design and learning to date from this effort can be used to inform consideration of further opportunities for the master metered market to participate in the NWA or MEDSIS pilot program portfolios. A new program in the industry called the Metered Energy Efficiency Transaction Structure or MEETs[22] reportedly is having success addressing the master metered energy efficiency challenge but the working group has not had time to investigate this program in depth.

WG3 also discussed the option of sub-metering the individual apartments. It was noted that in Texas there was a big push to sub-meter multi-family dwellings and that in Maryland there was a cost-benefit analysis recently completed on sub-metering[23]. The Maryland analysis, completed by the Maryland Public Service Commission, concluded that energy savings generally result when master metered buildings are converted and that programs that reduce the expense of the conversion encourages building owners to consider making the investment to convert. OPC recognized that in the District there are constraints on what areas can be sub-metered which are the jurisdiction of other District government agencies and not DCPSC's. In some cases, rezoning would need to occur

[22] http://www.meetscoalition.org/

[23] Master Meter Conversion Study - Required by House Bill 1491, Chapter 532, Section 2 of the Laws of Maryland - 2018 (MASR#11699)

to allow sub-metering. WG4 did recognize that even if sub-metering is outside of the DCPSC authority, the group could still recommend the DCPSC bring a recommendation to another District government entity who does have oversight.

Finally, WG3 was conscious of the cost of sub-metering or energy efficiency programs targeted at master metered buildings. It was suggested that some sort of incentive program may be the best option. Since residents in master metered buildings are often lower income, any costs for such a program would have to be socialized over the broader customer base.

The Customer Impact Working Group feels there are opportunities to create programs that allow both renters and landlords in master metered buildings to benefit from energy efficiency. Such programs would be consistent with the MEDSIS Vision Statement and with Title II of the new Clean Energy Omnibus law in DC which directs DC utilities to develop energy efficiency and demand response programs in coordination with the DOEE/DCSEU.

5.4.4.3 Stakeholder Positions

A. AOBA supports this recommendation and supports an amendment to existing law to authorize the use of sub metering and /or the use of energy allocation systems to improve the sensitivity of end users to the costs of utility services in master-metered apartments.

B. DCCA supports this recommendation.

C. DCSEU supports this recommendation.

D. DCSUN abstains from stating a position.

E. DOEE supports this recommendation and notes Pepco should consider the use of efficient, centralized space conditioning systems for master metered apartments in its low income EE programs, once developed.

F. General MicroGrids supports this recommendation.

G. Grid 2.0/ DC CUB/ Sierra Club support this recommendation.

H. GRID Alternatives Mid-Atlantic conditionally supports this recommendation, emphasizing the need for inter-program coordination with energy-related programs and low-income programs more broadly.

I. EEI supports this recommendation.

J. OPC dissents as Pepco can develop EE programs currently and as supported by the passage of the DC Clean Energy Act, so there is no need for the Commission to direct Pepco to develop EE programs. Additionally, this recommendation gives the appearance of pre-approval of any Pepco sponsored EE program resulting in automatic cost recovery from DC ratepayers.

K. Pepco supports this recommendation.

L. Sunrun supports this recommendation.

M. WGL Energy does not take any position with respect to this recommendation.

5.4.5 RECOMMENDATION – DCPSC TO ENHANCE CUSTOMER PARTICIPATION IN LOW INCOME PROGRAMS

5.4.5.1 Recommendation

The Customer Impact working group recommends the DCPSC enhance customer participation in low income programs by doing the following:

1. Ensure programs are created that target underserved communities for solar, electric vehicle, energy efficiency, time variant rates (e.g., time of use, real-time pricing), and demand response programs so long as they don't have adverse impacts. This should also include rebates on technologies like home area networks (HANs). Finally, programs should ensure any expansion of DER hosting capacity happens equitably across all neighborhoods.
2. In coordination with Recommendation 5.6.2, incorporate a scoring criteria in the Pilot Project Selection and Scoring process that assigns points and/or sufficiently considers projects that benefit low-income groups.
3. Consider the development of programs that allow small businesses to participate in assistance programs. Coordinate any such program with DOEE/DCSEU's programs for multifamily properties, shelters, or clinics that serve low-to moderate-income District residents including its "Income Qualified Efficiency Fund (IQEF)" which offers custom incentives used to subsidize energy efficiency projects and its "Income Qualified Lighting" program which offers deemed rebates for lighting projects.
4. Enhance the visibility of low-income (LI) programs through mention of the programs in DCPSC newsletters or other marketing outlets with the goal of driving more participation in these programs. Consolidate all LI program information in one, easy-to-access location on the DCPSC website. Include educational information to help customers understand qualification requirements. Information provided should be coordinated with DOEE, DOEE/DCSEU, and Pepco to ensure consistency with information provided on their websites.
5. Consider the possibility of transferring, with prior customer consent, customer data across initiatives, as it is desired that funding be leveraged across programs to seed deeper engagement/ savings from customers. This does not consistently occur today as data is not always available to make customers aware they qualify for multiple programs.
6. Consider future directives to enable more District residents to qualify for need based assistance programs and to incorporate other disadvantaged populations which could include the elderly, the disabled, those on fixed incomes, and those

without internet access. Leverage lessons learned from FC-1149[24], Experimental Rate for Seniors and Disabled, as it is implemented.

5.4.5.2 Background

The Customer Impact working group dedicated significant meeting time to the discussion of low-income (LI) customer needs and how to ensure LI communities participate in the benefits offered through MEDSIS cost effectively. Presentations offered by EEI, OPC, Nest, Grid Alternatives, and DOEE informed the Customer Impact working group on LI customer topics nationally and in the District specifically. Of note was the availability of existing programs at the Federal, District, and utility level targeted at LI customers. Income qualification guidelines varied among the programs, but the working group concluded these guidelines were adequate. Figure 5.9 below provides a summary of these programs. Also of note were the wide variety of DER programs launched by utilities across the nation that are making grid modernization advances like solar, storage and electric vehicles relevant to low income customers and other communities underserved by the competitive market. A listing prepared by EEI of sample utility low income DER programs was provided in the December 2018 working group meeting and uploaded to the Higher Logic workspace for stakeholder review.

Program	Description	Funding Authority	Income Qualification
Low Income Home Energy Assistance Program (LIHEAP)	Bill assistance between $250 and $1,800 as a once per fiscal year regular energy assistance benefit and a once per fiscal year emergency benefit for disconnected accounts up to $600. This benefit is based on household size, total household income, heating source, and type of dwelling.	US Department of Health & Human Services and local funding. DOEE manages the program and processes joint LIHEAP/UDP applications.	60% District State Median Income (Family of 4 = $59,457)
Utility Discount Program (UDP)	Includes the Residential Aid Credit for Pepco (Distribution and Surcharges (RAD, SETF and EATF) - approx. 30% savings off total bill); the Residential Essential Services discount for Washington Gas (approximately 25% off the annual bill); the Customer Assistance Program for DC Water (approximately $480 annually)	Funded by each participant utility; managed through the UDP Working Group and the PSC. DOEE processes joint LIHEAP/ UDP applications.	60% District State Median Income (Family of 4 = $59,457)
Weatherization Assistance Program (WAP)	Energy audits and installation of energy efficiency measures	US DOE sets guidelines. DOEE handles applications.	60% District State Median Income (Family of 4 = $59,457)

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[24] In the Matter of the Investigation into the Structure and Application of an Experimental Rate Class for Both Senior Citizens and Disabled Residents in the District of Columbia, Formal Case No. 1149

Program	Description	Funding Authority	Income Qualification
DCSEU LI Programs	Multiple programs	DC PSC via legislated surcharge. Income threshold defined in DCSEU contract. DOEE manages this contract.	80% Area Median Income (AMI). AMI is based on US HUD standard. Median Income (Family of 4 = $93,750) or 200% of federal poverty level
DOEE Solar for All	Targeting solar benefits to 100,000 low-to-moderate income families via solar on single family homes and community solar for renters by 2032; legislated goal to reduce energy bills by 50%	Renewable Portfolio Standard Expansion Amendment Act of 2016 Rider. DOEE oversees this program.	80% Area Median Income (AMI). AMI is based on US HUD standard. Median Income (Family of 4 = $93,750)
Experimental Rate for Seniors and Disabled	Provides a bill credit amount set at 50% of the fixed monthly customer charge for Distribution Residential Service – Schedule R, which at current rates would equal $7.50 a month	Interim funding from Customer Base Rate Credit resulting from Exelon merger. PEPCO and staff determine who qualifies for automatic enrollment	PEPCO customers that receive the D.C. Homestead Deduction and Senior Citizen/Disabled Property Tax reduction, own their home, and are not RAD customers. In 2017 the income limit was $128,950.

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Figure 5. 9 – Existing District LI Program Summary

Credit: WG4: Customer Impact February 2019 Meeting

LI customer issues were mapped to the MEDSIS principles as a way to drive to potential recommendations for the DCPSC. This process revealed that LI populations would likely prioritize the principle of Affordability over other MEDSIS principles. It was also recognized that expanding DER opportunities in the District, especially DERs for public infrastructure, can result in benefits to LI customers and potentially increase access to public/ private services like buses, trains, and ride share programs of importance to LI customers.

Finally, it was recognized that while there are existing programs offering assistance to customers using income as the metric for qualification, other disadvantaged communities could also benefit from similar programs. "Disadvantaged" is not a defined term but, as explained by EEI when presenting on programs offered through some of their member utilities, is applied as a criteria to address a broader range of vulnerable communities. The best example of this is in California where disadvantaged communities are targeted for investment using proceeds from the state's cap-and-trade program. Disadvantaged customers are defined using the CalEPA's CalEnviroScreen mapping tool[25] which assesses what census tracts are most disadvantaged using pollution and socioeconomic data. Disadvantaged communities are defined as the top 25% scoring areas from CalEnviroScreen along with other areas with high amounts of pollution and low populations.

While working toward the vision of MEDSIS, the DCPSC should always endeavor to balance the investments, and thus the costs, associated with realizing the vision against

[25] https://oehha.ca.gov/calenviroscreen/sb535

the need to ensure those investments deliver value and opportunity to all customer classes. Outreach to low-income households takes additional investment of time and resources to build trust. Project elements like workforce development targeting disadvantaged communities also require funding to provide those benefits. Because of this, WG4 stakeholders discussed or offered comments indicating the need for the DCPSC to consider LI factors when evaluating pilot project proposals including potentially adding targeted financial incentives to support pilot projects that benefit low-income groups. The combination of these approaches would ensure the additional investment of time and resources needed to adequately target and benefit low-income populations can result in higher costs, particularly when measured on a per-Watt capacity basis. Accordingly, WG6 should have caution with respect to potentially oversimplifying criteria, or expecting extra points to sufficiently capture the return on investment that low-income-focused project elements can provide.

5.4.5.3 Stakeholder Positions

A. DCCA supports conditionally. Add Washington Gas under provision "4."
B. DCSEU supports this recommendation.
C. DCSUN abstains from stating a position.
D. DOEE supports this recommendation and comments, "Where possible, DOEE recommends the reduction of duplication and coordination across low-income programs. There is already a low-income solar program and weatherization program (EE) and Pepco has been directed in its EE programs to focus on low-income. Regarding the pilot project metric, there is a concern that the burden of piloting new programs should not fall on low income families."
E. EEI supports this recommendation but wishes to provide additional information on the first part of the recommendation regarding creation of programs targeted at underserved communities. EEI supports equal opportunity and access to technology programs for all DC residents including low income/disadvantaged communities. However, there is limited precedent for utilities targeting solar at low-income customers because of the high cost, when those customers would be better served through lower-cost, utility-scale renewables and/or bill support programs. EV programs inclusive of low-income areas are more common. The Commission should look to successful program designs in other states to determine what makes the most sense in terms of technology targeting. Finally, EEI wishes to acknowledge that states that have made low-income technology adoption a priority have done so by allowing utility ownership of those resources – a clear way to ensure greater penetration of resources such as rooftop solar in low-income and disadvantaged communities.
F. General MicroGrids supports this recommendation.
G. Grid 2.0/DC CUB/ Sierra club support this recommendation.

H. GRID Alternatives Mid-Atlantic conditionally supports these recommendations, but suggests that point 3 could be improved by including nonprofits and community-based organizations as well as small businesses. In addition, GRID states that to target underserved communities most effectively, the DCPSC should consider partnering with organizations that have additional experience doing outreach in underserved communities.

I. NCS supports the recommendations with the following conditions:

   a. Paragraph (1) should specify that "adverse impacts" relates to low-income customer finances and grid reliability. Add energy storage to list of program types.

   b. Paragraph (3) should be strengthened to require prioritizing the utilization of small businesses to implement assistance programs.

   c. Paragraph (4) should include "participating small businesses" in list of entities coordinating information delivery.

J. OPC supports this recommendation with the following input:

   a. Paragraph (1) - OPC supports #1 with the sentence, "This should also include rebates on technologies like home area networks (HANs)." being struck from the recommendation

   b. Paragraph (2) - OPC supports item 2 of this recommendation.

   c. Paragraph (3) - OPC supports the intention, but DCPSC may not have the authority to effectuate the change sought this recommendation. Additionally, funds earmarked for low income residential ratepayers should not be diluted by adding another column to divert funds in the low-income sector. The funds should be utilized for its intended purpose.

   d. Paragraph (4) - OPC supports if "OPC" is added as an organization the DCPSC should coordinate the LI program information with.

   e. Paragraph (5) - OPC supports but feels the recommendation needs clearer language.

   f. Paragraph (6) - OPC supports item 6 of this recommendation.

K. Pepco supports this recommendation and notes that EEI shared with the working group a sampling of some very innovative utility programs to deliver DERs to low income communities including in deregulated markets. Examples of these programs include:

   a. Massachusetts: Eversource Electric Vehicle Program: EV program will be targeted toward disadvantaged communities

   b. Rhode Island: National Grid Modernization Plan: National Grid settlement in August 2018 authorized $13.6 million over three years in grid modernization, including investment in EV infrastructure and storage. Both

technologies will be targeted in part at low-income customers, including 25% off for income-eligible customers.

c. New York: The NYPSC allowed New York utilities to own generation (including storage) as a way to ensure low- and middle-income customers had equal access to the benefits of grid modernization. This determination allowed the approval of ConEd's low-income solar program.
d. Massachusetts: The state legislature approved an energy bill in 2016 allowing utility ownership of storage as a way to serve low-income customers and achieve state environmental goals.

This recommendation should include asking the DCPSC to consider ordering Pepco, in coordination with DCSEU, to develop demonstration programs for advancing solar, storage and electric transportation in underserved communities.

L. Sunrun supports this recommendation.

M. WGL Energy does not support this recommendation to the extent that it implies that Pepco is allowed under present laws to build solar for end use customers. Since the Commission does not regulate solar provided by third parties, WGL Energy recognizes that solar programs provided by the Sustainable Energy Utility in the District of Columbia (DC SEU using ratepayer funds will provide the majority of solar for low income along with community solar programs voluntarily provided by third parties. WGL Energy notes that the supplier community provides services to low income customers and offers added value to that community as well as to its other customers. Some suppliers have services especially for this segment. WGL Energy provides a budget bill product that many customers including low income customers prefer. However WGL Energy does not support Commission mandated supplier products for low income sector since suppliers prices are not regulated by the Commission.

Nor should Commission assume that only the utilities can offer value to this segment of customers nor that al/ low income customers wish to be denied an opportunity to choose a supplier of their choice. With this context, WGL Energy takes no further position with respect to the remaining items in this recommendation.

5.4.6 RECOMMENDATION – DCPSC TO REVISE THE CUSTOMER BILL OF RIGHTS (CBOR) TO SUPPORT THE MEDSIS PILOT PROJECTS PHASE

5.4.6.1 Recommendation

The DCPSC should evaluate the CBOR and update it to address the MEDSIS vision for a modern grid in time to support the Pilot Projects phase. The following specific considerations should be addressed when making updates:

1. Ensuring customers are notified up front regarding their rights and responsibilities when participating in or impacted by MEDSIS pilot projects.
2. Establishing provisional rules for customers to follow for initiating complaints during the MEDSIS Pilot Project phase. These rules would expire with the end of the MEDSIS pilots unless made permanent by DCPSC.
    a. process for complaints includes full disclosure up front of any third-party/customer decisions and contracts
    b. administrative hearing process / adjudicating process to mediate complaints in a timelier fashion
3. The provisional rules established under items 1 and 2 should address
    a. assets utilized by a customer or utilized at a customer site that are leased by a third party
    b. single and multi-customer microgrids
    c. any other DER requiring interconnection to the grid

To help communicate the availability of these changes to the CBOR and also to facilitate more consistent information around MEDSIS and the MEDSIS Pilot Projects, the DCPSC should:

1. Conduct town hall meetings in coordination with other DC Government agencies prior to the start of any MEDSIS pilot projects. These town hall meetings should include clear instructions to the public on where to get more information, who to contact with concerns, how to access the CBOR, and articulate customer rights and responsibilities should they participate in any of the MEDSIS Pilot Projects.
2. Provide material referenced during the town hall meetings in a handout made available to all customers potentially impacted by the pilot. This information should also be consolidated in one easy to find and easy to navigate location on the DCPSC website.

5.4.6.2 Background

As mentioned in Section 4.1.1, WG4 stakeholders discussed the subject of customer education and engagement in the October 2018 working group meeting. Guest speakers from OPC, Pepco, Oracle, Arcadia Power, and the American Coalition of Competitive Energy Suppliers (ACCES) all presented their perspectives on the importance of customer education. OPC, in particular highlighted the need for better education and awareness building around MEDSIS as customers can be skeptical of information being provided when in a marketing context and that customers may not always know where to find educational materials or know who to trust for this information.

In the February and March 2019 working group meetings this topic was revisited with OPC providing a refresher on the material they presented in October 2018 with

emphasis placed on suggestions/ recommendations for the working group's consideration. Of particular note by OPC was the gap that currently exists with customer protections afforded in the Consumer Bill of Rights (CBOR)26 as compared to the new energy marketplace envisioned as part of MEDSIS. In particular, MEDSIS will soon be moving to the Pilot Projects phase where new technologies, business models, and processes will be tested. The average DC resident or utility customer may not be fully aware of these initiatives nor of their rights as an electricity consumer under these pilot project constructs.

OPC highlighted some of the challenges they have experienced with the Solar for All program that resulted in calls from customers confused by solicitation from solar installers regarding disclosures and marketing practices. The lesson learned from that process was that the consumer protection and educational aspects of that program needed to be addressed beforehand rather than after the fact. This up-front plan should include budget and timing for community outreach. Communications to consumers should be clear and consistent. Finally, when issues do occur, the process for resolving customer's issues/complaints should be a more streamlined procedure as the current procedure is open ended. There was general agreement amongst stakeholders in the Microgrids Working Group (WG5) that there is a need to refine the current customer complaint process, specifically for assets that are leased or operated by third-parties. This discussion took form of Learning 5.5.9.

Pepco and DOEE both mentioned the Utility Discount Program (UDP) Working Group as a potential model to follow for coordination of messaging and outbound communications. Particularly, it was noted the UDP involves coordination across DC Government agencies and has dedicated funding set aside for messaging/ communications to consumers. Pepco also noted the current complaint process does have specific timelines for resolution but those timelines often are not adhered to by others involved in the process.

OPC also highlighted that with the MEDSIS pilot projects and even after the pilots phase, new technologies like microgrids could be deployed with third parties involved that are not currently regulated by the DCPSC. The CBOR has protections in place targeted at the utility and, to a lesser degree, at competitive electricity suppliers but does not address these new third party players that could emerge. Arcadia Power pointed out that just because a third party is not regulated by the DCPSC does not mean it is not subject to regulation. Pepco acknowledged this but felt going in to some of these new constructs without some regulation from the DCPSC in place could be problematic. It was noted the Microgrids Working Group (WG5) had created several recommendations around customer rights, responsibilities, and protection standards for single and multi-customer microgrids.

[26] https://dcpsc.org/Consumers-Corner/Utility-Bills-Complaints-and-Service-Providers/Consumer-Bill-of-Rights.aspx

5.4.6.3 Stakeholder Positions

A. DCCA conditionally supports this recommendation. Change language in the second line of the Recommendation to align it accurately with MEDSIS: change "MEDSIS vision for a modern grid" to "MEDSIS vision for a modern energy delivery system".

B. DCSEU supports this recommendation.

C. DCSUN abstains from stating a position.

D. DOEE supports the recommendation.

E. General MicroGrids supports this recommendation.

F. Grid 2.0/ DC CUB/ Sierra Club support this recommendation.

G. GRID Alternatives Mid-Atlantic supports this recommendation. We note that meeting information, handouts, and other materials should be proactively given to potentially impacted customers through targeted outreach, rather than passively made available with the burden on the customer to access the information.

H. EEI supports this recommendation. EEI recommends an update to the CBOR that adheres to the MEDIS mission of a modernized energy grid. Any updates should ensure customers are notified and informed about their rights when participating or impacted by MEDSIS pilot projects. In addition, customers should have clear guidance for initiating complaints during the MEDSIS pilot project phase. Complaints should include full disclosure for any third-party/customer decisions and contracts. Also, customer complaints should be conducted in a timely fashion. EEI supports advocacy about changes to the CBOR to educate customers and to facilitate awareness.

I. OPC supports this recommendation.

J. Pepco supports this recommendation with the qualification that Pepco believes the types of pilot projects listed under '3' that merit consumer protection consideration by the DCPSC is not exhaustive and the DCPSC should consider robust customer protections for all MEDSIS pilots.

K. Sunrun supports this recommendation.

L. WGL Energy generally supports this recommendation with the understanding the WGL Energy does not support economic regulation of multiple customer microgrids that are owned by third parties consistent with existing laws in the District of Columbia. See WGL comments on Recommendation on Section 5.5 for fuller explanation of this position.

5.4.7 LEARNING – OPPORTUNITY FOR RESILIENCE HUBS IN THE DISTRICT

5.4.7.1 Background

In the February 2019 Customer Impact working group (WG4) meeting, stakeholders heard from the Department of Energy and the Environment (DOEE) on their community engagement initiative in Ward 7. DOEE shared their learnings regarding how to best engage citizens in community driven planning. Engagement was facilitated through the development of an Equity Advisory Group (EAG) consisting of a cross section of community members, an independent evaluator, a neutral facilitator, and support from DOEE and Georgetown Climate Center. Using the EAG approach, the community was able to lead and be actively involved in developing community plans rather than passively participating while others presented them with information. This approach allowed the development of community plans with more stakeholder acceptance and buy-in.

DOEE went on to explain that through this engagement approach, the community members in Ward 7 recommended the establishment of a resilience hub in the Ward as indicated in Figure 5.10.

Figure 5. 10 – Summary of EAG Recommendations from Ward 7

Credit: DOEE Presentation from WG4 February 2019 Meeting

EAG members recommended the resilience hub:

- Be strategically located in trusted spaces that are recognized by the community they serve as welcoming and accessible
- Be resilient to physical hazards such as flooding
- Address physical and perceived barriers
- Offer resources during a disaster but also be a natural gathering place during non-emergencies
- Uplift the community through local hires and partnerships

More information on DOEE's vision for resilience hubs is available in the Sustainable DC Plan and further detailed in the Climate Ready DC Plan[27].

After DOEE's presentation, the WG4 members felt strongly that DOEE's EAG community engagement model should be replicated in the District and that resilience hubs were a great example of projects that should be supported due to their direct correlation with many of the MEDSIS principles. Additionally, it had been noted in prior WG4 meetings when discussing LI programs that a "resiliency center" that incorporated solar and storage would result in value to all customer groups including LI populations.

The result of the February 2019 WG4 meeting was a desire by stakeholders to include a resilience hub recommendation to the DCPSC. Specifically, the stakeholders wanted to recommend the DCPSC utilize MEDSIS funds to provide:

1. Assistance to finance the retrofits and new technologies needed to stand up a resilience hub in Ward 7 and/or
2. Assistance to replicate the community driven engagement process executed in Ward 7 in other communities to identify interest in additional resilience hubs across the city

DOEE requested time to consider such a recommendation internally with a plan to report back to WG4 in the March meeting. In the March 2019 meeting, DOEE explained that it was premature for WG4 to make a recommendation around DOEE's resilience hub initiative. This was primarily because DOEE planned ongoing community engagement in Ward 7 over the next year and had not yet selected a site thus it was not clear timing would align with the MEDSIS pilot projects timeline. To aid stakeholder's thinking around resilience hubs, DOEE offered the definition below for resilience hubs.

[27] http://www.sustainabledc.org/climatereadydc/

"Resilience Hubs are government designated community-serving facilities augmented to support residents and coordinate resource distribution and services before, during, or after a disruption. Key components of a hub include the following:

They are sited and designed with deep community-input. Ensuring community leaders and community-based organization are involved from the very beginning of the process and have an element of ownership over the site selection and design is essential.

They leverage trusted facilities that can be used year-round as neighborhood centers for community-building activities. Hubs recognize that disaster preparedness involves investing in community and preparing residents before a disruption occurs.

Site should be in good-working order, accessible, and be resourced to stay functional during extreme events. This may involve retrofits to support solar, energy storage, ADA compliance, and weatherproofing.

In addition to providing shelter and electricity during extreme events, hubs should maintain a supply of needed resources including water, food, ice, and basic medical supplies.

When designed well, Resilience Hubs can equitably enhance community resilience while reducing greenhouse gas emissions and improving local quality of life. They have the potential to reduce burden on local emergency response teams, improve access to public health initiatives, foster greater community cohesion, and increase the effectiveness of community-centered institutions and programs."

DOEE did offer the following suggestions to help unlock the potential of resilience hubs across the District:

1. Development of a streamlined interconnection process for DC Government designated resilience hubs (includes process, timeframe, cost, required studies, etc.)
2. Pilot a microgrid or islanding tariff which should include:
    a. Benefits provided by system with islanding capability
    b. Costs to distribution grid of providing standby service
    c. Value of resiliency (recognizing that this metric does not currently exist and is under development nationally)
    d. No double compensation for NWA or Demand Response

Note: Value created by the hub, through SRECs, as an NWA, ancillary services, etc. should be shared with the community through a CREF arrangement.

5.4.7.2 Conclusion

The conclusion reached by the WG4 stakeholders was that the resilience hub discussions held by the group should be recorded as a key learning and included in the working group report to the DCPSC. Regarding DOEE's suggestion on a streamlined

interconnection process, it was concluded the existing interconnection standards are adequate, but that Pepco should be brought in on the planning process earlier for resilience hub applications. In this way, Pepco can determine if there may be a coincident need that could be addressed through resource sharing thus reducing the cost of the resilience hub to the community, the city and/or ratepayers. There was discussion on whether the interconnection standards in the District need to be updated to address storage and islanding. It was noted the Microgrid Working Group (WG5) was discussing interconnection standards for microgrids and had recorded Recommendation 5.5.7 so no further action was needed by WG4.

Similarly, DOEE's suggestions on piloting a microgrid or islanding tariff had also been discussed by WG5 along with a broader discussion of regulatory treatment and customer protection standards for microgrids. It was determined that Recommendation 5.4 covers DOEE's suggestion for directing Pepco to establish a microgrid customer schedule. Further, the lesson's learned documented by WG5 includes a suggestion for piloting a multi-customer microgrid. As such, WG4 and WG5 discussions were coordinated with only the need to document the resilience hub learnings in WG4.

DOEE did object to the inclusion of this learning in the report as they felt there was nothing actionable by the Commission around Resilience Hubs. DOEE did suggest the DOEE outreach approach could serve as a model for use by the DCPSC on future projects and that all MEDSIS pilot projects should incorporate equitable community engagement in a form that makes sense for the pilot project being undertaken. WG4 stakeholders agreed with this suggestion. The MEDSIS Consultants noted that the requirement to address community engagement would be included in the Pilot Projects Screening and Scoring template (see Appendix A.8) being developed by the Pilot Projects Working Group (WG6).

5.4.7.3 Stakeholder Positions

A. DCSEU supports this learning.

B. DCSUN abstains from stating a position.

C. DOEE opposes this Learning being included in the report and offers, "As noted in the discussions in the April meetings, the PSC is looking for recommendations that are actionable from the Commission's perspective. While the discussions around Resilience Hubs were useful, there is nothing here that is actionable and DOEE recommends that this be removed from the report. If this learning remains in the report, the key "Learning" is that the equitable outreach and engagement model presented by DOEE could offer an effective strategy for future projects, but it takes time to do it right and to build relationships. The Conclusion portion needs to also include the language that DOEE provided for the definition of a resilience hub, with the emphasis that "Resilience Hubs" are District Government -designated entities with specific criteria and functionalities that address more than energy issues. DOEE would like to discourage others, respectfully, from

using this term simply because a project includes energy storage and onsite generation."

D. EEI acknowledges this learning and supports a resiliency hub construction plan in Ward 7 in conjunction with community outreach and engagement on future resiliency hub construction across the district. EEI also supports community and stakeholder engagement to further educate customers on MEDSIS pilot funding. Finally, EEI supports continued community engagement to gauge public interest in future resiliency hub construction.

E. General MicroGrids supports this learning.

F. Grid2.0/ DCCUB/ Sierra Club support this learning.

G. GRID Alternatives Mid Atlantic generally supports this learning.

H. NCS supports this learning.

I. OPC participated in this learning and understands the importance of resilience in the District. Furthermore OPC understands that DOEE is not ready to launch this initiative at this time.

J. Pepco acknowledges this learning with the qualification that a strong majority of stakeholders expressed considerable enthusiasm for putting forward two recommendations regarding resiliency hubs. The first would ask the DCPSC to consider using MEDSIS pilot funds to fund in part or in full the costs associated with creating a resiliency hub in Ward 7 based on the work already done by DOEE and documented in this learning. The second would ask the DCPSC to consider using MEDSIS pilot funds to advance the excellent community engagement model used by DOEE in Ward 7 to socialize the notion of resiliency hubs in other vulnerable areas of the city. Pepco further notes that the resiliency hub put forward for Ward 7 could be the core for a connected community that would bring solar, storage and emission-free transportation options, smart streetlights and other advanced public resource apparatus to this underserved community and use these resources to create a platform for energy education, workforce training, and civic engagement.

5.4.8 RECOMMENDATION – DCPSC TO ENSURE CONNECTION BETWEEN CUSTOMERS' ENERGY USAGE AND THEIR ENVIRONMENTAL IMPACT

5.4.8.1 Recommendation

The DCPSC should ensure a direct connection between customers' energy usage and their environmental impact through the deployment of home energy reports that display customers' carbon impact information. This would aid customers' decision making around participating in Pepco or third-party programs/ offers and encourage customer investment in non-carbon DER opportunities.

5.4.8.2 Background

This recommendation derived from WG4's discussion of customer data access and protection topics. Initially captured as one element of Recommendation 5.4.3, this recommendation was broken out as its own recommendation as a result of the April 2019 MEDSIS joint working group discussions. The working group discussed whether providing this information should be done on customer bills or as part of a separate home energy report like those used by Pepco in its Maryland territory. Data provided should emphasize greenhouse gas (GHG) generation and relative energy usage/cost compared to comparable homes/ businesses. Information should also offer energy usage improvement options and include references to available aid programs.

5.4.8.3 Stakeholder Positions

A. DCCA supports this recommendation. Washington Gas should also provide comparable data to its customers on their gas use.

B. DCSEU conditionally agrees with this recommendation and notes that it should be closely coordinated with other activities occurring in the district such as the Clean and Affordable Energy Act Benchmarking Requirement and the CleanEnergy DC Act Building Energy Performance Standard.

C. DCSUN abstains from stating a position.

D. DOEE supports this recommendation.

E. EEI supports this recommendation with caveats. As EEI stated in Recommendation 5.1.1, an electric customer's complete environmental impact is informed by far more than just energy usage. Other factors beyond energy generation sources will drive a customer's environmental impact—in particular, home insulation, and the quality of windows and doors. If the goal is to help educate an electric customer about his or her energy decisions, EEI could, for example, support the creation of a simple calculation translating reduced energy use to a certain amount of carbon reduction—but even a simplistic calculation such as this could be misleading and not particularly helpful or actionable for customers. EEI recommends that the Commission, should they opt to move forward with this recommendation, consider carefully the way in which the "connection" is drawn between energy usage and environmental impact.

F. General MicroGrids supports this recommendation.

G. Grid2.0/DCCUB/Sierra Club supports this recommendation and notes "that the DCPSC would also require similar carbon impact for District suppliers of natural gas and (potentially) other utilities."

H. GRID Alternatives Mid-Atlantic/ NCS support this recommendation.

I. OPC supports customers having access to their energy usage annually. OPC further believes that there needs to be some type of notice/educational component that advises a customer how to read their usage report and the

material needs to be customer friendly and clear and concise language should be utilized.

J. Pepco supports this recommendation. Pepco supports the use of a Maryland-type home energy report program and the notion of developing tools for customers to estimate their total lifestyle carbon footprint, which may go beyond the scope of home electricity usage.

K. Sunun supports this recommendation.

L. WGL Energy does not support and opposes this recommendation to the extent it asserts that third party energy suppliers must offer customers energy reports. While many suppliers and third party providers may choose to offer such programs the Commission only has authority to require that the utilities offer certain products as rate regulated entities.

   WGL Energy takes this position because competitive suppliers unlike utilities do not recover their costs from all ratepayers. Instead competitive suppliers price their services in a competitive market and offer value added products to their customers in order to differentiate their products from other suppliers' products or from the utilities' tariffed services. While many suppliers may choose to offer a variety of energy reports to their customers, especially if the utility is required to offer such a report; the minute suppliers are constrained by regulatory requirements the competitive nature of the market is diminished.

   WGL Energy could even assert that the requirement that utilities provide these energy reports impinges on the competitive market. However we recognize that with the Clean Energy Omnibus legislation it has become part of the Commission's responsibility to ensure that the utilities offer information to customers to create a sustainable energy market. However the Commission should not go further in a restructured market to mandate such reports in the competitive markets. They should not do so since the nature of a competitive market is to allow innovative responses to market needs not to dictate how the market must respond to those needs.

5.5 Microgrids

5.0 Microgrids							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.5.1	List of Microgrid Assets and Classifications in the District					x	
5.5.2	Learning: Need for Establishing a Regulatory Framework in the District and Leveraging Existing DCPSC and D.C. Government Standards			x	x	x	

5.0 Microgrids							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.5.3	DCPSC to Establish New Regulated Entity of "Microgrid Operator"		x	x	x	x	
5.5.4	DCPSC to Direct the Utility to Establish a Customer Microgrid Schedule		x	x	x	x	
5.5.5	DCPSC to Determine how Utilities Recover Costs of Microgrid Assets				x	x	
5.5.6	Learning: Opportunity to Define Resilience at the Distribution Level	x	x	x	x	x	
5.5.7	DCPSC to Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids	x			x	x	
5.5.8	DCPSC and D.C. to Modify Methodology for Calculating DCPSC and D.C. Law Surcharges on District Customers' Bills	x		x	x	X	
5.5.9	Learning: Need to Define a Customer Complaint Process for Assets that are Leased or Operated by Third-Party		X		x	x	
5.5.10	Learning: Opportunity to Leverage MEDSIS Funds to Pilot Multi-Customer Microgrids in the District					x	x

Table 5. 11 – WG5: Microgrids Recommendations and Learnings

5.5.1 LEARNING - LIST OF MICROGRID ASSETS AND CLASSIFICATIONS IN THE DISTRICT

5.5.1.1 Background

During the October 2018 Microgrid Working Group (WG5) meeting, the facilitator felt it was essential for the group to develop a list of all microgrid assets prior to discussing business models and regulatory treatment of microgrids in the District. The MEDSIS Consultant developed a draft list of microgrid assets based on input from stakeholders through discussion and an online survey. During the November 2018 WG5 meeting, a final list of microgrid assets was developed to be used in the MEDSIS process and to be presented to the DCPSC for consideration.

In the MEDSIS Staff Report, DCPSC Staff and stakeholders acknowledge that microgrids fall into different categories and structures. MRC discussed the many microgrid categories it believes are viable under the existing regulations including the opportunity for utility and third-party hybrid microgrid partnerships, where the utility owns certain distribution assets and the developer or customers owns the distributed generation and/or energy storage assets. The MRC suggested DCPSC recognize and support existing categories while also allowing for the exploration and creation of new ones, stating both are essential for community microgrid access, microgrid investment, private capital market support, and regulatory innovation. Microgrid Architect suggested that the DCPSC must establish simple categories of microgrids in order to develop straightforward packages of regulation.

The MEDSIS Vision Statement states the importance of "classifying DER and third-party microgrid providers generating energy and serving more than one customer as subject to the Commission's "authority" and the first step of WG5 was to establish these simple categories of microgrids to determine regulatory treatment. The main focus areas of WG5 were to discuss ownership and operation structures, business models and value propositions, and the different microgrid variances which led to appropriate microgrid classifications and regulatory treatments. The process of facilitating discussions to yield microgrid recommendations around classifications and regulatory treatment is illustrated in Figure 5.11 below.

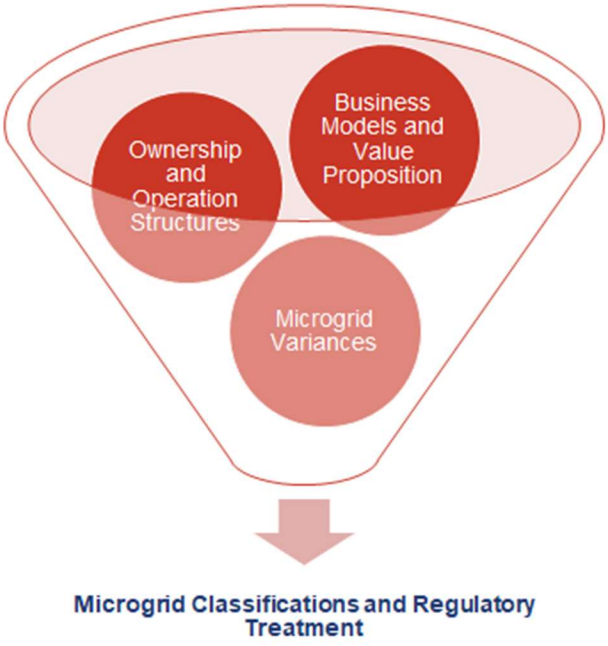

Figure 5. 11 – Microgrid Classifications and Regulatory Treatment

Credit: MEDSIS WG5: Microgrids

During the October 2018 WG5 meeting, stakeholders reviewed the types of microgrids as classified by DCPSC and the U.S. Department of Energy. This included the microgrid categories of single customer, single customer-campus and multiple customers. Stakeholders generally agreed that single customer and single customer-campus microgrids should not be treated under current regulation as an electric company or electricity supplier. As it related to microgrids serving multiple customers, stakeholders held differing views on regulatory treatment and further discussion around these types of microgrids was needed to determine regulatory treatment.

After the November 2018 WG5 meeting, stakeholders reached consensus on the classification of a Single Customer Microgrid. WG5 developed the following definition for single customer microgrid: "Behind-the-meter, single DER system that serves one customer or building's load and can island on demand. Single customer microgrids must be on contiguous property. The distributed generation, electricity imports, energy storage, distribution and microgrid controller assets of the microgrid are all owned, operated and managed by a customer or third-party."

During the December 2018 WG5 meeting, Pepco and MRC presented additional classifications of microgrids for consideration. The classifications of microgrids were presented as business models, including the ownership, operation and financial structure of each. In total, there were 6 types of microgrids that WG5 explored to be considered in the District: 1) Single Customer Microgrid, 2) Campus Microgrid Serving a Single Customer, 3) Host/Third-Party/Institutional/Consortium/Developer Microgrid Serving Multiple Customers, 4) Hybrid Microgrid Serving Multiple Customers, 5) Hybrid-Public Purpose Microgrid Serving Multiple Customers and 6) Public Purpose Utility Microgrid Serving Multiple Customers. Although the stakeholders tentatively agreed on these types of microgrids, WG5 identified several areas that required more attention in order to further agree upon the types of microgrids and the regulatory treatments of each.

From December 2018 through January 2019, MEDSIS Consultants collected stakeholder input via the MEDSIS workspace repository site in addition to several online surveys to develop a second iteration of a classification of microgrids.

After the January 2019 WG5 meeting, the six classifications of microgrids considered by WG5 for DCPSC's consideration were:

1) Single Customer Microgrid
2) 3rd Party Campus Single Customer Microgrid
3) 3rd Party Multi-Customer Microgrid
4) Hybrid Multi-Customer Microgrid
5) Hybrid Multi-Customer Public Purpose Microgrid
6) Utility Multi-Customer Public Purpose Microgrid

Some stakeholders believe the public purpose distinction is not necessary and that all microgrids could potentially serve critical load or a public purpose function. In addition,

some stakeholders believe there should not be a "Utility Multi-Customer Public Purpose Microgrid" because current legislation restricts utilities from owning generation for retail sales of electricity. During the March 2019 WG5 meeting, stakeholders decided it was best to keep the "Utility Multi-Customer Public Purpose Microgrid" classification in the discussion for potential microgrids, however it would require legislative modifications allowing the utility to own generation for purposes of selling to retail electricity customers. Similarly, there was discussion over whether an operator of a 3rd Party Multi-customer microgrid is performing the role of the utility and there was no agreement.

5.5.1.2 Conclusion

DCPSC should consider the list of microgrid assets and classifications in the District when exploring potential regulatory treatments to apply to different types of microgrids.

Microgrid Assets

1. Distributed Generation[28] - Any electric generating facility, as defined in D.C. Code § 34-205, which is connected to the electric distribution system in the District of Columbia and subject to the DCPSC Small Generator Interconnection Rules.
2. DER[29] - A resource sited close to the customer's load that can provide all or some of the customer's energy needs, may also be used under an NWA construct to either reduce demand (such as energy efficiency and/or demand response) or increase supply to satisfy the energy, capacity, and/or ancillary service needs of the distribution or transmission system.
3. Energy Storage[30] - A resource capable of absorbing energy from the grid, from a behind-the-meter generator, or other DER, storing it for a period of time and thereafter dispatching the energy for use on-site or back to the grid, regardless of where the resource is located on the electric distribution system. These resources include all types of energy storage technologies, regardless of their size or storage medium.
4. Electricity Imports – Including imported electricity through a retailer for end-use electricity sales.
5. Microgrid Controls

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28 Definition of "Distributed Generation" from FC1130 MEDSIS NOFR Amending Provisions of Title 15 of the DCMR

29 Definition of "DER" from FC1130 MEDSIS NOFR Amending Provisions of Title 15 of the DCMR. A microgrid's "DER system" may contain multiple DERs of different types under common control.

30 Definition of "Energy Storage" from FC1130 MEDSIS NOFR Amending Provisions of Title 15 of the DCMR

   a. Including but not limited to: isolation switches, sensors, meters, switchgear controls, thermal controls, interconnection controls, SCADA and communication hardware/software.

6. Distribution Assets
   a. Existing or newly created assets including but not limited to: conduits, wires, poles, voltage regulators, isolation switches, telecommunication assets, feeders DERMS, ADMS, SCADA, transformers, inverters, substations. Distribution assets can be internal to the microgrid or on the utility's side of the point of common coupling.
7. Thermal Assets
   a. Including but not limited to: boilers, chillers, thermal exchangers, heat pumps and chilled-water or ice storage.

Microgrid Classifications (see Figure 5.12)

1) Single Customer Microgrid is a DER system located behind-the-meter or point of common coupling that serves one customer or building's load and acts as a single controllable entity. Single Customer Microgrids must be on one property or contiguous properties (crossing no public rights of way). A Single Customer Microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected and islanded mode. The ownership, operation and / or management of the microgrid assets can vary between the customer and / or third-party. Examples include residential or commercial microgrids.
2) Third Party Campus Single Customer Microgrid is a DER system located behind-the-meter or point of common coupling that serves multiple buildings and acts as a single controllable entity. Third Party Campus Single Customer Microgrids can serve single customer loads that are on contiguous or non-contiguous properties. A Third Party Campus Single Customer Microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected and islanded mode. The ownership, operation and/or management of the microgrid assets can vary between the customer and third-party. Examples include college and university campuses, business parks, manufacturing facilities, chemical processing plants, shipping and processing facilities, data centers, and military bases.
3) Third Party Multi-Customer Microgrid is a DER system that serves multiple customers and acts as a single controllable entity. Third Party Multi-Customer Microgrids can serve multiple users' loads that are on contiguous or non-contiguous properties. A Third Party Multi-Customer Microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected and islanded mode. The ownership, operation and/or management of the microgrid assets vary between the customer and third-party. Examples include mixed-use real estate development and data centers.

4) Hybrid Multi-Customer Microgrid is a DER system that serves multiple customers and acts as a single controllable entity. Hybrid Multi-Customer Microgrids can serve multiple users' loads that are on contiguous or non-contiguous properties. A Hybrid Multi-Customer Microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected and islanded mode. The ownership of distributed generation assets can vary between the third-party and customer. The ownership, operation and/or management of newly created non-generation microgrid assets can vary between the utility, third-party and/or customer.
5) Hybrid Multi-Customer Public Purpose Microgrid is a DER system that serves multiple customers and acts as a single controllable entity. Hybrid Multi-Customer Public Purpose Microgrids can serve multiple users' loads that are on contiguous or non-contiguous properties. A Hybrid Multi-Customer Public Purpose Microgrid must serve a group of customers, likely with municipal or other public facilities as anchors. A Hybrid Multi-Customer Public Purpose Microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected and islanded mode. The ownership of distributed generation assets can vary between the third-party and customer. The ownership, operation and/or management of newly created non-generation microgrid assets can very between the utility, third-party and/or customer. Examples include communication centers, police and fire stations, wastewater treatment plants, schools, emergency shelters, grocery stores, and gas stations.
6) Utility Multi-Customer Public Purpose Microgrid is a DER system that serves multiple customers and acts as a single controllable entity. Utility Multi-Customer Public Purpose Microgrids can serve multiple users loads that are on contiguous or non-contiguous properties. A Utility Multi-Customer Public Purpose Microgrid must serve a group of customers, likely with municipal or other public facilities as anchors. A Utility Multi-Customer Public Purpose Microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected and islanded mode. The ownership, operation and/or management of all microgrid assets would be with the utility. Current legislation restricts utilities from owning generation for purposes of selling retail electricity and this microgrid classification is not allowed under current District law. Examples include communication centers, police and fire stations, wastewater treatment plants, schools, emergency shelters, grocery stores, and gas stations.

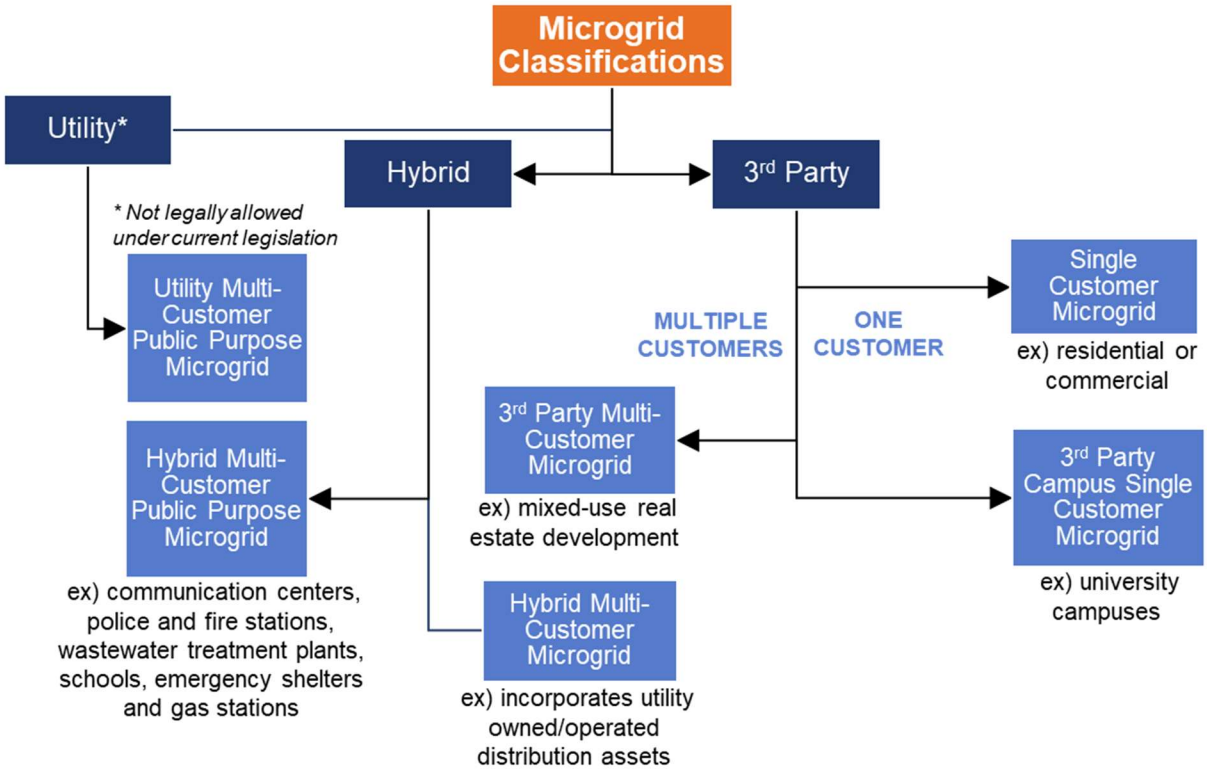


Figure 5. 12 – Potential Microgrid Classification for Consideration in the District

Credit: MEDSIS WG5: Microgrids

5.5.1.3 Stakeholder Positions

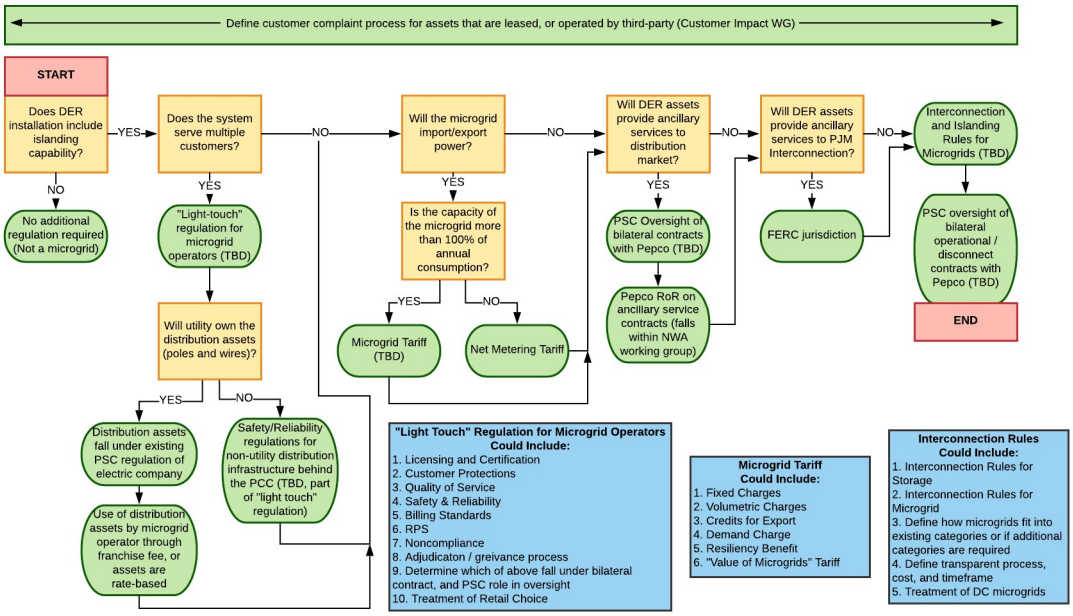
A. DCCA supports this learning conditionally, stating that "Microgrid Controls" should include advanced inverters. Advanced inverters with IEEE 1547-2018 Performance Standard Category 2 or 3 functionalities are both microgrid controls as well as distribution assets as they represent the point of common coupling. If they are classified as distribution assets, then they would necessarily be utility owned and rate-based.

B. DCSEU conditionally supports this learning: microgrids should be managed as D.E.R. plus islanding. A list of assets, while informative, does not add value as islanding is the only crucial identifier of a microgrid. Assets will vary and will change with technology.

C. DCSUN abstains from stating a position.

D. DOEE disagrees with this learning, stating that "a microgrid is capable of hosting variable technologies" and "it does not make sense to have a technology list that will always change in the future." DOEE states that "the assets themselves are less important than the regulatory treatment of particular types of service functions and capabilities provided to the microgrid customers as well as to the

distribution grid." DOEE submits that a regulatory flowchart, "like the example provided by DOEE that shows the types of regulatory treatment required that should capture every potential scenario" is more useful than microgrid classifications. DOEE proposes that "microgrids that are single-customer and exist behind a meter should not be treated differently than other DER systems



once appropriate tariff classes and interconnection rules are in place." DOEE believes the "main thrust of DCPSC regulation around microgrids will come around the regulatory treatment of multi-customer microgrids" and "suggests recommending to DCPSC to develop a regulatory flowchart for microgrid scenarios addressing service and operational characteristics." DOEE also opposes the recommended classification of a Utility Multi-Customer Public Purpose Microgrid, stating that "without a legislative change utilities cannot own generation" and that the public purpose term "is too broad a term to be a useful designation for microgrids."

E. EEI acknowledges this learning but would like to provide the following additions:

   a. Regarding the list of microgrid assets:

      i. EEI does not believe that asset #4 ("electricity imports") are an asset, but an element or a resource of the microgrid. This distinction is important because "assets" tend to be physical infrastructure, property owned by a stakeholder and, thereby, subject to regulation, whereas "elements" or "resources" only refer to the different components of a microgrid. EEI believes that the list of assets and the purpose for identifying them ("exploring potential

regulatory treatments to apply to different types of microgrids") are not well aligned.

b. Regarding the list of microgrid classifications:

i. EEI sees the list of classifications not as a catalogue of existing types of microgrids, but as an illustration of the Working's Group thinking at the time—that is, as a hypothetical list of potential microgrids. Actual microgrids could be a combination of the classifications presented. Microgrids are new and models are still evolving. It is important that taxonomies maintain the highest level of flexibility while keeping the basic attributes of a microgrid.

ii. Regulation of microgrids should not be based on this classification, but on the actual transactions and the services provided.

iii. Ownership of assets within a microgrid should not be a fixed, determining factor of each type of microgrid. It should be possible, for instance, that the assets of a single customer microgrid are owned by the customer, a third party, or the utility. The taxonomy presented should thereby focus on the number of customers and the architecture and operation of the microgrid, rather than ownership parameters. If ownership details are to be maintained, it is important to note that utilities, not only third parties and customers, should be able to own microgrid assets (notwithstanding existing regulatory restrictions) under all single and multi-customer microgrid types.

F. General MicroGrids believes that it has been helpful to delineate a taxonomy of microgrid business model classifications to help inform the DCPSC about the circumstances under which microgrid organization and operations could raise utility regulatory issues and trigger the "authority" and oversight of the DCPSC. However, GMI also maintains that such classifications, by themselves, do not sufficiently inform regulatory decision-making concerning appropriate regulatory treatment and reform measures that are needed to recognize and monetize the "value" streams that microgrids could provide to the Grid, Market, Grid Customers and Communities to achieve the MEDSIS Vision, according to its guiding principles.

G. Grid2.0/DCCUB/Sierra Club supports this learning and adds the following observations. "Classifying" different microgrid business models and their variances does not set out the kinds of reforms that are needed to recognize and monetize the "value" streams that microgrids can provide to the Grid, Market and Communities. The proposed classifications only address factors such as the number of customers, types of assets, size, contiguous or non-contiguous properties, cross public tight-of-ways, etc. These characteristics do not address the capabilities of microgrids (their unique physical and operating characteristics) that can generate an array of benefits and that should be evaluated by utilities as

part of their planning, investments and operations to meet system and customer needs. Based on a consistent, verifiable methodology for valuation of costs and benefits, utilities should compare microgrid services/benefits (irrespective of ownership/business model classification) to traditional investment options, with a view to pursuing the most cost-effective solutions to meet the particular problems/issues/needs of the power system and customers.

H. MRC believes "that for the District to attract investment in microgrids, regulation needs to be clear, predictable, and not overly burdensome or variable." MRC conditionally supports this learning, suggesting that only the following four classifications are needed: (1) Single Customer Microgrids; (2) Third Party Campus Single Customer Microgrids; (3) Third Party Campus Multi-Customer Microgrids; and (4) Hybrid Multi-Customer Microgrids. MRC notes the first three of these classifications reflect real, existing microgrids in the District and the fourth reflects real, existing microgrids elsewhere in the country. MRC opposes the "public purpose" related microgrid classifications discussed in this learning. MRC states that nationally "there is general confusion over the 'public purpose' concept and it being a proxy for rebundling (in deregulated jurisdictions) and ratebasing." MRC proposes that any microgrid including one or more critical facility (e.g. first responder, hospital, pumping station, grocery store, gas / charging station, etc.) loads that provide essential community services on its critical circuits / islanding list be classified as "Public Purpose" and receive a "Resilient Community Services Payment" from the Sustainability Energy Trust Fund Program. MRC suggests that this is a straight-forward "where the rubber hits the road" mechanism to address resiliency value. MRC points out the DC Code recognizes the ability of customers / owners / landlords to serve their tenants / occupants. MRC highlights that when a classification discusses serving a "customer(s)" (including in single customer microgrids), it should be understood that it may include such customer(s) serving their tenants. A microgrid may serve combinations and collectives of customers (such customers may be owners, lessees, and managers under the DC Code) and tenants.

I. OPC conditionally supports this learning with said caveats and more specifically conditionally supports DOEE's comment that a regulatory flowchart is needed as well as EEI's comment that assets be changed to elements of a microgrid.

J. Pepco acknowledges this learning with the following qualifications:

   a. Advanced inverters are an additional type of microgrid control asset.

   b. Reclosers and underground switches are additional distribution assets.

   c. CHP is an additional thermal asset.

   d. Microgrid models are still under development and classification is premature and creates a false expectation that individual microgrids will fall into these clearly-defined categories.

e. Theoretical models should not be the basis for regulation, but rather the purpose of the microgrid (public purpose vs. select service) and how the various functions of a microgrid are handled (ownership of assets, operation of assets, delivery of services, etc.) should inform how current regulations are adapted or applied to microgrids.

f. Electric distribution companies in the District are barred from owning generation for the purpose of retail sales. The distribution assets in a multi-customer microgrid serve the same function as the distribution assets held by an electric distribution company. It follows that if an electric distribution company is barred from owning generation for retail sale and a multi-customer microgrid acts as an electric distribution company, the owner and operator of the distribution assets in a multi-customer microgrid should not be permitted to own the generation in a microgrid as well. Under this construct, model 3 is not permissible.

g. The models listed in 3-5 should be modified to allow for utility ownership of non-generation assets.

K. VEIC agrees with the framing of this learning but proposes to "reduce the categories to three: 1) Single Customer Microgrids, 2) Multi-Customer Microgrids and 3) Hybrid Multi-Customer Microgrids." VEIC states that the "public purpose" designation will lead to gray areas and regulatory complexity" and "the social value of local resiliency should not be a factor in how a microgrid is treated from the point of view from the wider grid." VEIC continues stating that "extra financial and logistical support for public-purpose resiliency can come from other, existing sources." Referring to one-building single customer microgrids and a campus-style single customer microgrids, VEIC states there is little differences between the two and that "they're each behind a single meter and do not cross a right-of-way, so it is not necessary to draw this distinction from a regulatory perspective."

5.5.2 LEARNING - NEED FOR ESTABLISHING A MICROGRID REGULATORY FRAMEWORK IN THE DISTRICT LEVERAGING EXISTING DCPSC AND D.C. GOVERNMENT STANDARDS

5.5.2.1 Background

Microgrids have been identified in the District as one of a number of tools for improving resiliency and facilitating DER deployment. It was established within the working group that in order to determine appropriate regulatory treatment of microgrids, the stakeholders had to first identify microgrid assets, establish microgrid classifications and examine microgrid varieties. Another important piece to determining regulatory treatment is developing an understanding of existing DCPSC standards and regulations applied to electric companies and electricity suppliers in the District. After several discussions, it was generally agreed upon that microgrids that serve multiple customers at the very least should be regulated similarly to electricity suppliers. Some

stakeholders believe a reading of current D.C. law indicates that microgrids serving multiple customers are serving as an electric company and should be regulated as such. The concern of several stakeholders engaged in the for-profit business of sustainable energy development is that the burden of formulation of regulated rates, implementing standard offer service auctions, and meeting reliability standards reporting requirements would be prohibitive to private, multi-customer microgrid development. These stakeholders noted that the procedural requirements to develop such rate regulation filings were designed to regulate large utility distribution networks and not individual, privately financed microgrids and warned that rate regulation would restrict third party multi-customer microgrid development and financing in the District. The concern voiced by Pepco, EEI and OPC were that third-party owned and operated microgrids serving multiple customers would effectively act as unregulated monopolies without requisite consumer protections afforded by DCPSC oversight.

Based on the need in the District for developing microgrid regulatory frameworks, the Recommendations 5.5.3 through 5.5.12 walk through several regulatory decisions per microgrid classification and variations.

The stakeholders discussed how the DCPSC can modify its current regulations to ensure all microgrid development in the District achieves the MEDSIS Vision Statement. In October 2018, DCPSC amended Title 15 of the DCMR to include revised definitions of an electric company, electricity supplier, behind-the-meter generator, and eligible customer-generator or net energy metering facility. Table 5.12 below summarizes the compliance standards that are applicable to each designation.

Compliance Standards	Electric Company	Electricity Supplier	NEM Facility
Customer Protection Standards of Section 327	X	X	
Consumer Rights and Responsibilities of Title 15 DCMR	X	X	
Customer or Retail Choice	X	X	
Billing Error Notification (EQSS of Title 15 DCMR)	X	X	
Associated Compliance Reporting (EQSS of Title 15 DCMR)	X	X	
Fuel Mix and Emissions Requirements of Title 15 DCMR	X	X	
Renewable Energy Portfolio Standard of Title 15 DCMR	X	X	
Services Outages, Manhole Incidents and Power Quality Compliant Report Requirements (EQSS Standards of Title 15 DCMR)	X		
Customer Service Standards (EQSS of Title 15 DCMR)	X		
Reliability Standards (EQSS of Title 15 DCMR)	X		

Certificate of Public Convenience and Necessity	X		
NESC Safety and Performance Standards	X		
Licensure of Electricity Suppliers		X	
NEC Safety and Performance Standards			X
Net Energy Billing and Crediting for Customers			X
Net Energy Metering Standard Contract			X
Billing and Credit for Community Net Metering Customers			X

Table 5. 12 – Applicable Compliance Standards by Designation

Source: DCPSC Codes and Regulations

WG5 has discussed several regulatory treatment considerations for microgrids. The regulatory treatment considerations include, ownership/operation, cost recovery, interconnection, construction, permitting, renewable portfolio standard (RPS) and emission requirements, consumer rights and responsibilities, customer protection, retail choice, billing tax and surcharges, safety and electrical codes, and electricity quality of service standards.

The working group has determined that different microgrid varieties may call for different regulatory treatments. Some of the microgrid varieties discussed include:

- Size of Microgrid
- Microgrid Assets
- Number of Customers
- Market Participation: Providing Ancillary Services for Distribution vs. Wholesale Market
- Behind-the-Meter versus Front-of-the-Meter
- Use of Utility Distribution Assets vs. Newly Created Non-Utility Distribution Assets
- Contiguous versus Non-Contiguous Property
- Percentage (%) of Imports and Percentage (%) of Exports
- Microgrid Capacity versus Annual Consumption

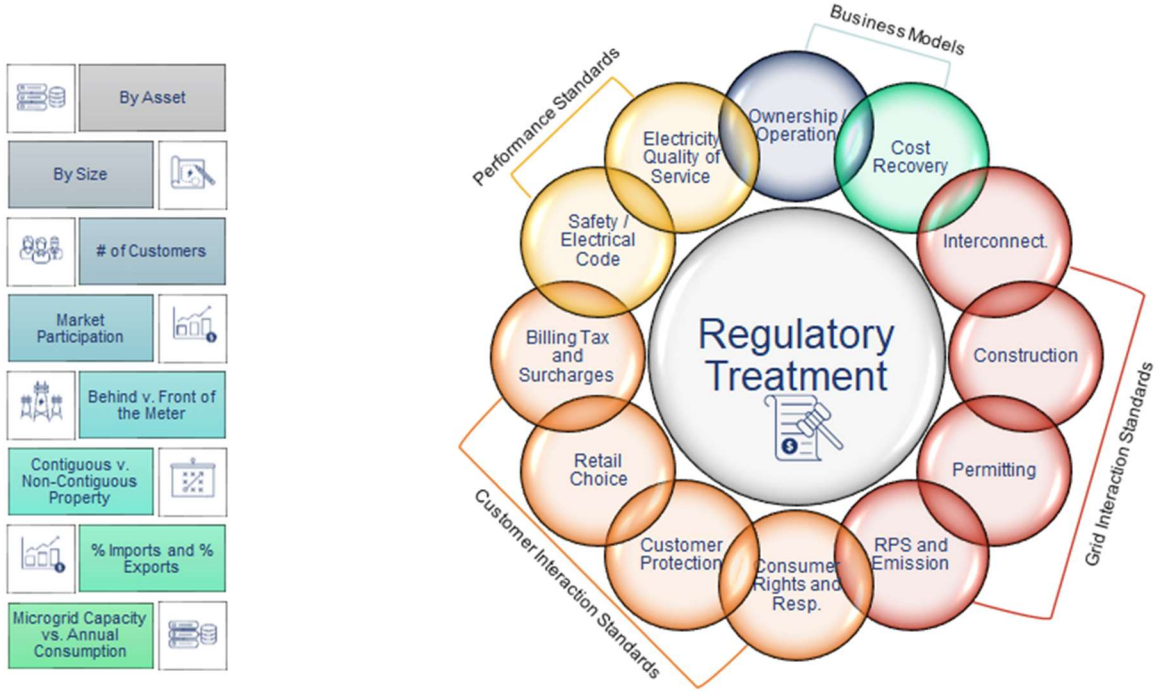


Figure 5. 13 – Variances of Microgrid Regulatory Treatment

Source: Smart Electric Power Alliance

5.5.2.2 Conclusion

DCPSC should leverage the existing DCPSC and D.C. Government standards to determine the appropriate set of regulations for microgrids in the District.

A. Microgrid development industry stakeholders, public interest groups and clean energy advocates generally agree that microgrids serving multiple customers are not unregulated monopolies and should be subject to DCPSC regulations addressing customer protection and consumer rights and responsibilities (with some microgrid specific disclosures and modifications) that apply to Electricity Suppliers. These stakeholders submit that the DCPSC can effectively regulate third party multi-customer microgrids without general rate regulation and that microgrid rates and other commercial terms could be left to private contract and judicial enforcement.

B. Utility industry stakeholders and ratepayer advocates general agree that microgrids serving multiple customers effectively act as unregulated monopolies without rate regulation and should be subject to electricity quality of service standards afforded by DCPSC oversight of regulated monopolies in the District.

DCPSC should consider the microgrid purpose and function when determining the appropriate set of regulations. The working group developed four categories of regulatory treatment for consideration by the DCPSC.

1. Business Model: The business models of a microgrid are determined by the entities that own and operate the different microgrid assets, the associated financial structures and cost recovery mechanisms.
2. Grid Interactions: The microgrid-to-grid interactions to consider include construction, permitting, interconnection, RPS and emissions requirements of building, interconnecting into the grid, stand-by requirements placed on the utility for the microgrid and all its customers and operating the microgrid.
3. Customer Interactions: The microgrid-to-customer interactions to consider include the licensing and certification of microgrid operators, applicable microgrid billing surcharges, microgrid customer retail choice dynamics, microgrid customer rates and protection and microgrid consumer rights and responsibilities.
4. Performance Standards: The microgrid performance standards to consider include safety and electrical code and electricity quality of service.

The working group also developed a list of questions for the DCPSC to consider when applying rules, tariffs and regulations to microgrids and microgrid operators discussed in the recommendations and learnings in the Microgrid section.

1. Is the microgrid constructed to provide benefits to all District customers, to specifically serve a discrete group of District businesses and residents, or both?
2. Does the operation of the microgrid involve the new citing of carbon-based generation or the increased use of carbon-based generation in the District?
3. Does the system serve multiple customers? Refer to Recommendations 5.5.3 on appropriate consumer rights and responsibilities, customer protection, electricity quality of service, construction and permitting, safety and electrical codes and RPS and emission requirements standards that should be considered for microgrid operators.
4. Does the system have medium-voltage distribution assets? Refer to Recommendations 5.5.3 on appropriate electricity quality of service, construction and permitting, and safety and electrical codes standards that should be considered for microgrid operators.
5. Does the utility currently own or will a utility entity own the distribution assets? Refer to Recommendations 5.5.3 on appropriate consumer rights and responsibilities, customer protection, electricity quality of service, construction and permitting, safety and electrical codes and RPS and emission requirements standards that should be considered for microgrid operators
6. Will a non-utility entity own the microgrid distribution assets? Refer to Recommendations 5.5.3 on appropriate consumer rights and responsibilities, customer protection, electricity quality of service, construction and permitting, safety and electrical codes and RPS and emission requirements standards that should be considered for microgrid operators

7. Will the microgrid export power? Refer to Recommendation 5.5.3 and 5.5.4 on appropriate regulations for microgrid operators and tariffs for a microgrid customer.
8. Will DER assets provide distribution services to the utility? Refer to Recommendation 5.5.5 on appropriate cost recovery mechanisms for microgrid assets.
9. Will DER assets provide energy, capacity, and/or ancillary services to PJM Interconnection? Refer to FERC jurisdictional requirements

5.5.2.3 Stakeholder Positions

A. DCSUN abstains from stating a position.

B. DOEE supports a regulatory flowchart that can address varying microgrid services and operational characteristics and believes that a new concept of 'microgrid operator' is needed and an accompanying "light-touch" regulatory treatment for multi-customer microgrids. DOEE submits that "consistent with our comment on [Learning 5.5.13], a microgrid operator should be a separate designation that is neither an Electricity Supplier nor an Electric Company" and should "apply to multi-customer microgrids so that an appropriate regulatory framework can be applied that covers safety, quality of service, and consumer protection." DOEE disagrees that the regulatory framework should be based on existing standards that are applied to Electric Companies or Electric Suppliers, as a microgrid is neither of those things. DOEE stresses that microgrids can be a key tool, as a DERM (DER management) system, for increasing the potential of renewable energy integration in the District and that an enabling framework for microgrids requires new tools and concepts. The ownership structure of a microgrid is not relevant to the PSC from a regulatory perspective unless the distribution assets are owned by a utility. The microgrid size is also not relevant to the PSC in creating an overarching regulatory framework, with the exception of updating the Net Metering framework to encourage microgrid and back-up power DER systems. Rather than "number of customers," the relevant distinction is whether or not a microgrid is a single or multi-customer entity. Any microgrid that is not a multi-customer microgrid should not be covered under a microgrid operator designation, because there are already adequate rules for single-customer DER systems (with the exception of appropriate net metering rules, islanding rules, and storage interconnection rules). DOEE stresses that a single customer microgrid, i.e. a campus, is not regulated currently, and that it does not need to be regulated. The only type of microgrid that requires a new regulatory framework is a multi-customer microgrid. DOEE disagrees that the PSC should regulate microgrids based on both "purpose and function." It may not be appropriate to make a distinction based on whether or not a microgrid serves only the microgrid customers or the greater population, because all microgrids serve some public purpose, whether by allowing customers to shelter in place

during a grid outage, or improving the overall resilience of the macrogrid (i.e. self-healing).

C. EEI acknowledges this learning but notes that microgrids should not receive special treatment for the mere fact of being a microgrid, and the assets forming the microgrid should also not benefit from a different treatment compared to stand-alone DERs. For example, if it is determined that a microgrid is performing the same function and providing the same service as PEPCO (as would likely be the case in all multiple-customer microgrid configurations), then the microgrid should be subject to the same type and level of regulation as PEPCO. When establishing a regulatory framework for microgrids, special attention should be given to the safety and reliability of the distribution grid to prevent penalizing customers that are not in the microgrid. Additionally, special attention should be paid to customer protection with the priority of avoiding cost-shifting, ensuring retail choice is maintained, and ensuring universal service within the microgrid.

D. General MicroGrids stated that "the Conclusion and Background to this "Learning" are based on "static" factors relating to salient elements of current utility regulation and do not address the capabilities and unique physical and operating characteristics of microgrids that can generate benefits and services in the public interest to meet changing power system and customer needs in a manner to cost-effectively advance the DC MEDSIS Vision according to its guiding principles. Regulatory "treatment" should be related to the functions that a microgrid performs and the benefits and services that can be derived from such capabilities. Without an examination and evaluation of such capabilities and the benefits and services the functions generate, the "value proposition" of microgrid systems cannot be assessed, their benefits/services cannot be addressed by appropriate regulatory reform and these benefits and services cannot be monetized to attract investment."

E. Grid2.0/DCCUB/Sierra Club generally supports this learning, and suggest that the reform process should be tied to the value that microgrids can provide the grid, market and communities, based on their functions and capabilities (and not just the business model classifications). The business model classifications are all based on factors material to the current regulatory structure, which was designed to address different technologies, needs and interests relating to the delivery of efficient and reliable electricity services than the forces of change (technology, policy, and market) that the electric sector is facing today. Unique microgrid attributes require examination and potential rule changes in these following areas to enable the benefits that microgrids can provide the grid, market and communities, while also preserving and enhancing grid reliability, safety, affordability, and efficiency:

    a. Evaluation of microgrid interconnection processes and procedures, taking into account IEEE standards (addressing inverters, distributed energy resources, microgrid controllers and other related standards that have

become effective or are under development), and considering changes that other jurisdictions have made or are addressing.

b. Evaluation of "outcome-based" energy performance indicators and metrics that could capture the efficiencies, cost-savings and technology synergies that microgrids can provide to the grid, customers, market, and community. This requires a much larger conversation within the District, given that these performance indicators and metrics must be interrelated with community land-use development, integrated demand-side management, optimized renewable energy deployment, district heating and cooling, load-leveling and shaping; reduction in energy use intensity, etc.

c. Development of a consistent, verifiable methodology for valuation of microgrid costs and benefits so that microgrid solutions can be properly included in integrated distribution resource planning to further the goals of the MEDSIS proceeding, consistent with its guiding Principles.

d. Limitation any utility cost-recovery associated with microgrid interconnections to the extent that it benefits all District customers

F. MRC generally supports this learning and notes that microgrids may serve as PJM resources (e.g. asset-backed economic demand resources) in addition to serving included load and providing locally customized services to PEPCO under DSSAs. MRC suggests that a microgrid can be privately funded AND serve the surrounding community as well as benefit all District ratepayers by: (1) including critical facilities (see comments above on any microgrid being a “public purpose” microgrid) on its islanding / critical load list; and (2) entering into Distribution Support Service Agreements (DSSAs) to provide custom services to PEPCO. MRC suggests that PEPCO is increasingly going to be “conducting the DER concert” in the District, and expects PEPCO to build stacks of DSSAs to be able to call multiple microgrids into a variety of service postures at the same time. These two mechanisms empower ratepayers to benefit from microgrid services without having to pay for microgrid capital expenses to get them. For the last several years MRC has been supporting the concept of a microgrid operator / manager (a combination of certain traditional asset manager, energy manager, and more recent retail aggregator / consolidator roles) for multi-customer microgrids across several jurisdictions. It is envisioned that the microgrid operator / manager would, among other things: (1) arrange for the operations and maintenance services provider; (2) coordinate operations and offtake of onsite DER; (3) coordinate the operations of the (customer owned or utility-owned in a hybrid classification) microgrid distribution system; (4) arrange for microgrid metering configurations; (5) retain an Electricity Supplier for imports as well as to manage the billing of microgrid users (customers and their tenants) for both imported and onsite DER supply; and (6) retain a Curtailment Service Provider or another type of PJM market integrator / power marketer. The MRC believes the microgrid operator / manager may also itself be an Electricity

Supplier. Further, MRC believes the microgrid operator / manager may also serve as "the customer for the microgrid" and the PEPCO account holder under the recommended customer microgrid tariff. All multi-customer microgrids should be required to appoint a microgrid operator / manager. MRC supports a "light touch" regulatory framework for multi-customer microgrids that addresses safety, quality of service, and consumer protection, but stops short of the rate regulation that would effectively stymie development and finance in the District. MRC believes the District needs microgrids to form the advanced DER backbone of a smarter grid, support overall DER deployment, sustain essential community services, meet environmental goals, and give PEPCO finer control over distribution system operations via DSSAs and associated DERMS.

G. OPC supports this learning.

H. Pepco acknowledges this learning but believes that the notion of light touch regulation of multi-customer microgrids is foundationally flawed because:

   a. As an electric distribution company in the District, Pepco is subject to regulation as the owner and operator of electric distribution assets. If a microgrid owner/developer owns the equipment used to distribute electricity, then it is performing the same function as Pepco and should be subject to the same regulations with regards to safety, reliability, pricing, etc. If the Commission were to allow another entity to distribute electricity to multiple customers without subjecting it to the same regulations as those applied to Pepco, then it is in effect saying that there is nothing inherent in electricity distribution services that requires regulation and thus there is no basis for regulating Pepco. 'Light touch regulation' of multi-customer microgrids undermines the foundation for Commission regulation of all electric distribution companies, including Pepco. If, in fact, the basis for regulating Pepco is because it is a monopoly, then the fact that a microgrid is providing distribution service to multiple customers in the Pepco service territory effectively destroys the Pepco monopoly and further undermines the basis for Commission regulation of any electric distribution company.

   b. The application of a light touch regulatory approach would deprive microgrid customers of rate regulation, certain complaint rights, successor customer rights, billing/payment rights, and – critically – being able to rely on the utility to provide reliable service. In addition, by allowing fractured planning and reliability responsibility and facility duplication, a light touch approach could result in inefficiencies and waste, increased stranded costs, the inequitable shifting of costs and disputes over who pays for grid reliability and for a variety of programs advanced by the utility that benefit the community as a whole. With regard to the specific learnings noted above:

   c. Grid interactions should include necessary utility system upgrades

d. Customer interactions should include customer data privacy and security protections

e. Performance standards should include reliability, restoration, emergency response, and reporting requirements

f. A microgrid (or a DER asset within a microgrid) that serves a 'distribution service to the utility' is effectively an NWA and should not be treated differently than any other DER asset/program in the NWA context where asset ownership is not factored into the analysis done to determine the best solution to a grid need from a grid reliability and ratepayer affordability perspective. Thus, the discussion in item '8' is more appropriately referred to Recommendation 5.2.3.

g. The suggestion that has been made by a few stakeholders that microgrids could offer other distribution services to the utility is highly speculative. As a result, the creation of a DSSA, a mechanism by which ratepayers would assume some portion of a select service microgrid's costs for some type of undefined grid benefit, is premature and inconsistent with the MEDSIS principles of affordable and non-discriminatory.

h. Assuring that microgrids do not negatively impact the reliability of the larger grid and do not pose safety and security risks necessitates that the operator of the larger grid (Pepco) is afforded visibility into and some degree of control over microgrids.

i. Assuring that microgrids do not negatively impact the ability of the District to achieve its climate goals requires that carbon-emitting generation within a microgrid be limited to operation during events when grid-supplied energy is not available.

5.5.3 RECOMMENDATION – DCPSC TO ESTABLISH A NEW REGULATED ENTITY OF "MICROGRID OPERATOR"

5.5.3.1 Recommendation

DCPSC should define and establish a new regulated entity of "microgrid operator". A "microgrid operator" is any entity that operates a microgrid serving multiple customers. DCPSC should decide what types of regulations need to be applied to microgrid operators. Stakeholder input and positions regarding appropriate consumer rights and responsibilities, customer protection, customer choice, electricity quality of service, RPS and fuel mix/emissions requirements, construction and permitting, safety and electric code standards are included below.

For single customer microgrids and third party campus single customer microgrids, current DCPSC rules and regulations are sufficient and there is no need to make new rules and regulations for single customer microgrids. Private contracts with a single

customer are an appropriate mechanism to address customer right and responsibilities, customer protection and electricity quality of service.

A. Consumer Rights and Responsibilities and Customer Protection

For all Multi-Customer Microgrids, DCPSC should apply Consumer Rights and Responsibilities and Customer Protection standards parallel to the standards applicable to Electricity Suppliers and Electric Companies as outlined in Title 15 of DCMR.

B. Customer Choice

For all Multi-Customer Microgrids, several stakeholders believe a private contract with microgrid-specific disclosure provisions is sufficient for retail choice and should be subject to compliance review regarding such provisions by DCPSC. If the DCPSC decides that private contract is sufficient, DCPSC should ensure appropriate use of microgrid-specific private contract disclosure provisions can allow for safe harboring of such private contracts from advanced DCPSC review. Safe harbor provisions regulated by the DCPSC could include but are not limiting to full disclosure of long term retail choice, restrictions on the ability for individual customers to exercise customer choice for imported electricity separately from the microgrid operator's decision, appropriate customer disclosure of the microgrid itself and the associated long-term commitment.

C. Electricity Quality of Service

1. If the microgrid imports electricity from a supplier, it should be subject to electricity quality of service standards parallel to the standards applicable to Electricity Suppliers as outlined in Title 15 of DCMR.
2. If the microgrid has existing or new utility distribution assets, than the microgrid operator should be subject to electricity quality of service standards parallel to the standards applicable to Electric Companies as outlined in Title 15 of DCMR.
3. For all Multi-Customer Microgrids serving retail electricity to multiple customers, stakeholders discussed two options for regulatory treatment that the DCPSC could consider. Note that these two recommendations are mutually exclusive of each other.
    a) DCPSC should have minimal regulatory oversight by developing safe harbor regulations for electricity quality of service disclosure requirements for private contracts and assert jurisdiction over such contracts in connection with the breach of such safe harbor regulations and disclosure requirements between microgrid operators and microgrid customers.
    b) DCPSC should apply the electricity quality of service standards parallel to the standards applicable to Electric Companies as outlined in Title 15 of DCMR to multi-customer microgrid operators.

D. RPS and Fuel Mix/Emissions Requirements

If the microgrid operator imports electricity, it should be subject to similar RPS and Fuel Mix Emission Requirements standards applicable to Electricity Suppliers in Title 15 of DCMR. The on-site distributed generation assets within the microgrid should be subject to the DC Clean Energy Act considerations for on-site generation and building performance.

E. Construction and Permitting

1. If the microgrid has low-voltage distribution assets below 13.8 kiloVolts (kV), it should be held to existing DCRA construction codes.
2. If the microgrid has utility-owned medium voltage distribution assets above 13.8kV, it must be required to file a Notice of Construction (NOC) and a Certification of Public Convenience Necessity (CPCN) for consideration by the DCPSC.
3. If the microgrid has newly created, non-utility owned medium voltage distribution assets above 13.8kV, further investigation by DCPSC is required to determine the appropriate DCPSC regulatory oversight, along with other District government jurisdiction for these types of microgrids.

F. Safety and Electrical Codes

1. All microgrids should be held to existing Institute of Electrical and Electronics Engineers (IEEE) and Underwriters Laboratories Inc.) (UL) safety and performance standards.
2. If the microgrid has low-voltage distribution assets below 13.8kV, it should be held to existing DCRA safety and performance standards[31].

If the microgrid has medium voltage distribution assets above 13.8kV, it should be held to The National Electrical Safety Code (NESC) guidelines for practical safeguarding of utility workers and the public during installation, operation and maintenance of electric supply, communication lines and associated equipment.

5.5.3.2 Background

Stakeholders have discussed regulations in detail regarding consumer rights and responsibilities, customer protection, electricity quality of service, construction and permitting, safety and electrical codes and RPS and emissions requirement standards for microgrids.

[31] According to D.C. Department of Consumer and Regulatory Affairs (DCRA) codes and standards, low-voltage microgrid systems under 13.8kV would follow DCRA's Safety and Performance Standards. These standards follow the National Fire Protection Association (NFPA) 70 and National Electrical Code (NEC) 2011 safety and performance standards.

A. Consumer Rights and Responsibilities and Customer Protection

Stakeholders discussed how to apply existing Consumer Rights and Responsibilities and Customer Protection standards for Electrical Companies and Electricity suppliers to microgrid operators. Stakeholders also generally agree that developing educational materials and programs around microgrids would lessen the burden on the DCPSC. Education may include public programs on microgrids, lists of qualified representatives, etc.

B. Customer Choice

Stakeholders also discussed in detail how customer choice fits into microgrids. Customer choice under D.C. Law means 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. All customers have the opportunity under this right to purchase electricity supply from their choice of licensed electricity supplier. WG5 discussed several questions to determine whether microgrid development restricts or enables customer choice in the District.

a) Microgrid developer industry stakeholders, public interest groups and clean energy advocates suggested that private contracts including full disclosure of the microgrid and long-term commitment would be sufficient to enable retail choice in microgrids serving multiple customers. These private contracts should be subject to DCPSC review regarding such disclosures.

b) Utility industry stakeholders and ratepayer advocates voiced concern that microgrids could restrict customer choice for those customers moving into a multi-customer microgrid development. In addition to moving into multi-customer microgrid developments, these stakeholders believe there are not sufficient rules in place to handle moving out of a multi-customer microgrid development or what happens when a third-party microgrid project turns over ownership or becomes bankrupt.

C. Electricity Quality of Service

As it relates to electricity quality of service, stakeholders in the working group gravitated to one of two trains of thoughts.

a) One - held by microgrid development industry, public interest groups and clean energy advocates - is that electricity quality of service should be handled directly through contractual requirements between the microgrid operator and its customer(s). These stakeholders believe that items such as service requirements, uptime, outages, power quality and liquidated damages can be included in a private contract. These stakeholders also stated that some microgrid customers may choose to allow the microgrid operator to give them less reliable service or longer restoration times in exchange for a discounted rate on the electrical service portion of their microgrid charges. These stakeholders also believe that the DCPSC should include safe harbor provisions that dictate utility reliability as the threshold microgrid performance level which if not met

trigger DCPSC action over the contractual disclosure requirements and DCPSC has regulatory oversight in the event of a breach of contract. Amongst these stakeholders, there is general agreement that a microgrid operator should be held to parallel standards for Electricity Suppliers, not those of Electric Companies.

b) The other - held by utility industry and ratepayer advocacy stakeholders - is that electricity quality of service of microgrids serving multiple customers should be held to the same standards as electric companies. Thus the possibility of charging differentiated rates based on service levels within a microgrid is proof that the microgrid operator is effectively selling electricity service and must therefore be regulated as an Electric Company, thereby affording those consumers and businesses served by a microgrid the same protections from the Commission as those offered to other District electricity customers.

D. RPS and Fuel Mix/Emissions Requirements.

Stakeholders discussed in detail how to ensure the development of microgrids furthers the sustainability aspect of the MEDSIS Vision Statement. WG5 reviewed existing RPS and Fuel Mix/Emissions Requirement Standards as well as newly legislated standards within the DC Clean Energy Act to develop a recommendation to apply a combination of existing standards to all microgrids that import electricity and have on-site distributed generation.

E. Construction and Permitting

Stakeholders have discussed in detail how to treat regulations around construction and permitting for the different classifications of microgrids, including insights from distribution system engineers and current D.C. Department of Consumer and Regulatory (DCRA) building and construction codes.

F. Safety and Electrical Codes

Stakeholders have discussed in detail how to treat regulations around safety and electrical codes for the different classifications of microgrids. In October 2018, the DCPSC released definitions and rules around behind-the-meter generators. According to existing compliance standards, behind-the-meter generators are subject to safety and performance standards established by National Electrical Code (NEC), National Electrical Safety Code (NESC), the Institute of Electrical and Electronics Engineers (IEEE) and Underwriters Laboratories (UL). Specifically, there are several construction and permitting codes that exist in the District that may apply to microgrid development. In addition to the D.C. construction codes in Title 12 of DCMR, there are several codes and standards followed by the D.C. Department of Consumer and Regulatory Affairs (DCRA). Here is the list of existing DCRA[32] safety and electrical codes:

- DC Building Code

[32] https://dcra.dc.gov/page/district-columbia-construction-codes

- DC Property Maintenance Code
- DC Green Construction Code
- DC Energy Conservation Code
- DC Fire Code
- DC Mechanical Code
- DC Plumbing
- 2011 ICC Codes and 2011 National Electric Codes

MEDSIS Consultants reached out to representatives from DCRA to determine their potential jurisdiction depending on the location and sizes of microgrid projects. The stakeholders identified the need to ensure all microgrid classifications are covered by appropriate safety and electrical codes and standards.

5.5.3.3 Stakeholder Positions

General Comments

A. DCCA generally supports this recommendation although questions remain about some provisions: The DCPSC website should contain full information about rights, responsibilities and protections for consumers considering entering into microgrid contracts.

B. DOEE supports the creation of a Microgrid Operator designation, as separate from the Electric Company and Electric Supplier designations. DOEE's intention in recommending this designation is to provide a "light touch" regulatory framework, specifically and only for multi-user microgrids in the District, in response to the PSC's request to consider light touch microgrid regulation. DOEE stresses that other types of microgrids, i.e. single-customer or campus-based microgrids, do not need to be regulated. For the multi-customer microgrids, the PSC should seek to create a light touch framework, which will enable such microgrids, which in turn will help the District achieve its clean energy goals. DOEE notes that designing an operating framework begins to remove barriers to successful microgrid integration, but does not solve the inability of the current distribution grid to value the "full stack" of benefits that microgrids can provide to the macrogrid. Enabling the creation of a distribution-level ancillary services market will be critical for creating an environment in which microgrids and other types of DER can realize their full potential. The PSC should also create a definition for the Point of Common Coupling (PCC), which has thus far not been discussed in the microgrid section of this report. Again, DOEE emphasizes that its comments below apply only to multi-customer microgrids, since other types of microgrids should not be regulated:

C. EEI opposes this recommendation and does not think it is necessary, or advisable, to create a separate entity for purposes of regulation. The “microgrid

operator" is a term better used to understand the functions and responsibilities of a multi-customer microgrid rather than as a new type of entity. EEI does not agree with the underlying assumptions that a "microgrid operator" is fundamentally different from other regulated entities (i.e., regulated utility), and that multi-customer microgrids (basis for the new entity) are similar enough in function and structure that they all need the same type of regulation. EEI believes that neither the microgrid nor the resources that it encompasses should be regulated any differently than comparable resources or entities for which standards and regulations already exist. All microgrids should be regulated according to the function that they perform and the microgrid resources should meet existing standards, rules, and regulations just like any other comparable resource (see comment to 5.2). For example, all multi-customer microgrids should be subject to the same quality of service standards and other regulations as the regulated utility and all resources should be subject to the same environmental and other regulations as any other DERs. Also, all microgrids should be subject to the same appropriate regulations without distinction of voltage, operation, or ownership. Regarding quality of service, it is worth noting the different position held by various stakeholders, as voiced in MEDSIS working group discussions. On one hand is the position held by the microgrid development industry and public interest groups, among others. They believe that electricity quality of service should be handled directly through contractual requirements between the microgrid operator and its customer(s). Further, they believe that items such as service requirements, uptime, outages, power quality, and liquidated damages can be included in a private contract. These stakeholders also stated that some microgrid customers may choose to allow the microgrid operator to give them less reliable service or longer restoration times in exchange for a discounted rate on the electrical service portion of their microgrid charges. These stakeholders also believe that the DCPSC should include safe harbor provisions that dictate utility reliability as the threshold microgrid performance level, which, if not met, would trigger DCPSC action over the contractual disclosure requirements since the Commission has regulatory oversight in the event of a breach of contract. Amongst these stakeholders, there is general agreement that a microgrid operator should be held to parallel standards for those of electric suppliers, not those of electric utilities. On the other hand is the position of the utility industry and ratepayer advocates. These stakeholders, EEI among them, believe that the electricity quality of service of a microgrid serving multiple customers should be held to the same standards as an electric utility, thereby not requiring establishment of a separate microgrid operator. The possibility of charging differentiated rates based on service levels within a microgrid is proof that the microgrid operator is effectively selling electricity service and must therefore be regulated as an electric utility, thereby affording consumers and businesses served by a microgrid the same protections by the Commission as those offered to other District electric customers.

D. General MicroGrids supports the recommendation conditionally, with a big stated condition that this Recommendation be reworded and reframed to reflect the consensus reached during the Workshop on the need to create a new regulated entity of “Microgrid Operator.” GMI supports the need for a new regulated entity classification. However, the way in which this Recommendation is currently worded does not reflect the consensus of the parties on the rationale for such a new classification, nor does it address “Regulation” beyond taking up categories of regulation that concern protections, safeguards, restrictions, standards of operation in the public interest under existing utility regulation, based on a taxonomy of “business model classifications” delineated by the Working Group.

E. Grid2.0/DCCUB/Sierra Club supports this recommendation conditionally. The recommendation as drafted does not reflect the need/rationale for creating a new "Microgrid Operator" classification outside the existing classifications of "electricity utility" or "electricity supplier." Regulation, based on classification of “microgrid operator should not only address needed protections, safeguards, restrictions, etc. in the public interest; but must also recognize benefits and services that microgrids can provide. Exploring a new "microgrid operator" classification should address such benefits and service to determine how to recognize and monetize such benefits/services (e.g. resiliency) so microgrids can be properly regulated, in some instances potentially with a “light touch,” as well as adequately and consistently compensated.

F. GRID Alternatives MidAtlantic / NCS agree with those stakeholders who commented that multi-customer microgrids generally should not necessarily be treated identically to rate-regulated electric distribution companies in all respects and should not be subject to more stringent standards. We also endorse DOEE’s recommendation that MEDSIS enable, rather than penalize, people’s ability to participate in multi-customer microgrids.

G. OPC voices several concerns with the use of a microgrid operator terminology and supports a rulemaking being established as the definition utilized is too broad in nature to adopt.

H. Pepco opposes this recommendation for the following reasons:

    a. Pepco believes that the current DC regulatory constructs and regulations applied to electricity suppliers and electric distribution companies are adequate to regulate any and all microgrids. Whoever owns and operates the equipment used to distribute electricity to customers within a microgrid is performing a function essentially the same as an electric distribution company and should be subject to the same regulations with regards to safety, reliability, pricing, etc. If the Commission were to allow any entity to distribute electricity to multiple customers without subjecting it to the same regulations as those applied to Pepco, then it is in effect saying that there is nothing inherent in electricity distribution services that requires regulation and thus there is no basis for regulating Pepco. If in fact, the

basis for regulating Pepco is because it is a monopoly; then the fact that a microgrid owner is providing distribution service to multiple customers in the Pepco service territory effectively destroys the Pepco monopoly and the basis for regulating Pepco.

b. The use of the term 'safe harbor' is very ambiguous and implies that the microgrid operator is afforded protection from recourse for failure to perform as expected or contracted. The ambiguity of this very discussion is evidence of the need for the application of existing utility regulations to multi-customer microgrids to assure that initial and future microgrid customers' rights are protected.

c. The testimony offered by Douglas Development at the townhall portion of the April Microgrid working group meeting was impactful and should be considered. Douglas Development expressed an interest in offering microgrids to prospective tenants, a commitment to maintaining customer choice, and a desire to work with Pepco to assure that they are not expected to take on the role of an electricity delivery service provider.

I. Sunrun abstains from stating a position.

J. WGL Energy strongly opposes Recommendation 5.5.3.1 with respect to third party microgrids serving multiple customers as it assumes that all multi-customer microgrids must be regulated by the Commission; when, in fact, the Commission has a pending case to decide this question on first impression. WGL Energy asserts that existing laws can be applied to protect safety, environmental and customer impacts for a third party microgrid that may be contractually constructed to comply with all existing laws and offer microgrid services in the District of Columbia. WGL Energy also asserts that no new regulatory regime is needed for multi-customer microgrids that are legally constructed to meet existing regulations and laws. The Commission should not assume that all multi-customer microgrids need additional regulation without examining the specifics of the legal construct of that pending microgrid case. Until the pending case is decided the Commission should not rule on this particular aspect of this recommendation. If it should adopt regulations prior to the resolution of that pending case that project must be grandfathered as those new regulations cannot apply without interfering with legal contracts that pre-date the new regulations.

Comments on Consumer Rights and Responsibilities and Customer Protection

A. DCCA supports this portion of the recommendation, stating that the DCPSC website should contain full information about rights, responsibilities and protections for consumers considering entering into microgrid contracts."

B. DOEE disagrees with this portion of the recommendation, and believes that the interaction between the microgrid customer and the microgrid operator should be

contractual; however, the PSC should designate a plan for redress in the event of a conflict or customer concerns.

C. EEI supports this portion of the recommendation.

D. Grid2.0/DCCUB/Sierra Club supports this portion of the recommendation.

E. GRID Alternatives MidAtlantic supports this portion of the recommendation.

F. MRC conditionally supports this portion of the recommendation, suggesting for multi-customer microgrids, the microgrid operator / manager would either be, or retain, an licensed Electricity Supplier that is under DCPSC oversight to provide imported supply, sale and billing services to microgrid customers (in connection with onsite DER and imported power) and "a private contract between such Electricity Supplier and microgrid customers with additional required microgrid-specific consumer protection disclosures is sufficient to cover customer rights, responsibilities, and protections related to the microgrid's onsite DER system and imported power. In this manner, the customer protection requirements (with microgrid-specific disclosure additions) that apply to Electricity Suppliers serving District customers will also apply to microgrid customers." MRC adds that the contractual disclosure requirements "should at minimum cover additional required microgrid-specific consumer protection disclosures related to islanding and retail choice." Further, MRC supports the safe harboring of such private contracts from advanced DCPSC review, with such review arising in connection with a dispute over breach of such disclosure requirements. MRC highlights Electricity Suppliers are already allowed to provide customers competitive electricity supply without advance review of the individual retail rates offered to customers by DCPSC, and that with the addition of microgrid specific disclosures, there is not a consumer protection rationale to subject multi-customer microgrids to rate regulation. MRC believes consumer protection manifests with the entity making the final sale to customers and their tenants, and for customers of multi-customer microgrids that entity will be a regulated and licensed Electricity Supplier. The fact that the microgrid operator / manager contracts with the multi-customer microgrid's distribution system owners / customers to allow the microgrid's operations and maintenance provider and Electricity Supplier to use the owners / customers distribution system should not change the regulatory treatment. It is common for building and property owners / customers to own the electricity distribution infrastructure within their properties and to "self-distribute" electricity on their side of the utility meter / point of common coupling. The microgrid context should not impact the long-standing ability of property owners to distribute power within their property to themselves and their tenants. Traditionally, such activity has not been considered to provide the same services as large, open access, public distribution networks. With the exception of hybrid microgrid classifications, the customers / entities receiving electric services within a microgrid, either own the microgrid's distribution system or are a tenant of such owners (who are allowed under DC Code to serve

electricity to the tenants of their buildings, and such tenants excluded from the definition of "Customer" under the Code) and are self-distributing.

G. OPC supports Consumer Rights and Responsibilities and Customer protections being adopted and states that there should be "education around rights, responsibilities and protections before entering into microgrid contracts."

H. Pepco conditionally supports this recommendation, adding a new statement that "in order to protect customers it should be recognized that DCPSC has the authority to review and approve rates for the retail customers of microgrids as they do for the customer of other public utilities." Pepco proposes support of applying consumer rights/responsibilities and protection standards parallel to the standards applicable to Electricity Supplier if a Single Customer Microgrid and parallel to the standards applicable to Electric Company if a Multi-Customer Microgrid. Pepco believes that any transaction between a microgrid owner/operator and an entity receiving electricity service from the microgrid was effectively electricity distribution and should be subject to regulation as a utility to assure that these served entities were note effectively forfeiting Commission protection through complex contracting.

I. WGL Energy opposes this portion of the recommendation for the reasons stated earlier in its opposition above in Section 5.5.3.3.A.f.

Comments on Customer Choice

A. DCCA supports part A of this portion of the recommendation and has no position on part B.

B. DOEE would like to acknowledge that customers entering into a microgrid community are already exercising their retail choice in a meaningful way. DOEE supports this portion of the recommendation.

C. EEI opposes this recommendation, stating that "multi-customer microgrids should be regulated as electric utilities since they essentially aim at performing the same functions and providing the same services."

D. Grid2.0/DCCUB/Sierra Club supports this portion of the recommendation.

E. Microgrid Architect conditionally support this portion of the recommendation, stating that retail choice for microgrids serving multiple customers can be handled through private contract with full disclosure of long term retail choice.

F. MRC conditionally supports this portion of the recommendation, pointing out "that property owners and long-term lessees get to choose their Electricity Supplier under the existing regulations, including through collective selections by owners associations, regardless of the microgrid context." MRC further points out that under the existing regulations, building tenants provided power by owners / customers do not get to select Electricity Suppliers, regardless of the microgrid context." Therefore, MRC supports the ability of owners and long-term lessees to choose to contract with a multi-customer microgrid operator / manager and

delegate to them the choice of Electricity Supplier for the microgrid. This is not technically a "restriction" on customer choice, as such owners / customers would be exercising the same authority and power select how their Electricity Supplier is chosen regardless of the microgrid context. Notwithstanding the forgoing, MRC believes microgrid-specific contractual disclosure requirements by a multi-customer microgrid's Electricity Supplier are appropriate to describe the customer choice and islanding dynamics that are present to provide heightened consumer protection. MRC believes "that agreements between a microgrid's Electricity Supplier and the microgrid's customers or their tenants should be safe harbored from advanced DCPSC's review of their microgrid-specific disclosure provisions. Review should only be triggered by a related complaint or dispute."

G. OPC stated that the "recommendation as written is confusing – a template for disclosures needs to be adopted for all microgrid owners to use that is approved by the Commission.

H. Pepco notes that DCPSC should approve private contracts in which retail choice and microgrid reliability standards are discussed and that these contracts should be subject to a regular DCPSC-based review of compliance. Pepco also "believes multi-customer microgrids should be regulated as electric distribution companies."

I. WGL Energy asserts that a private contract may be sufficient to protect consumer rights to customer choice and for the same reasons stated in its objection to the [establishment of a new regulated entity "Microgrid Operator"] and therefore opposes this portion of the recommendation to the extent it implies otherwise.

Comments on Electricity Quality of Service

A. DCCA supports this portion of the recommendation.

B. DOEE disagrees with this portion of the recommendation as written. If electricity is imported from a supplier, the imports have therefore already been covered under existing rules for Suppliers and it does not make sense to apply those rules to a microgrid operator. If the microgrid is using utility distribution assets (whether new or used), the microgrid operator should not be subject to the EQSS - that responsibility should fall upon the utility that owns the infrastructure. The point of regulation for the PSC in the case of utility-owned infrastructure should cover contractual obligations between the utility and the microgrid operator around the use of the distribution infrastructure. DOEE supports option a), which implies a light-touch EQSS regulatory framework, rather than applying the standards that are intended for Electric Companies.

C. Grid2.0/DCCUB/Sierra Club supports this portion of the recommendation and adds that for multi-customer microgrids, it is unnecessary at this time to apply electricity quality of service standards parallel to the standards applicable to

Electric Companies as outlined in Title 15 of DCMR. However the DCPSC should reserve the right to apply these standards at a future date if experience warrants.

D. MRC conditionally supports the first a) option of this portion of the recommendation. MRC believes that "the reliability related quality of service standards (reporting of outages, etc.) need to be modified to functionally address microgrid specific dynamics such as islanding, load shedding and critical load lists." Further, MRC believes (as with microgrid-specific retail choice-related disclosures) that the DCPSC should include safe harbor provisions and avoid the burden of advance microgrid Electricity Supplier contract review for microgrid-related QSS disclosure; provided, however, DCPSC action would trigger if a dispute arises over compliance with the contractual disclosure requirements. A microgrid operator / manager, if also an Electricity Supplier, or its retained Electricity Supplier, should be held to parallel QSSs for Electricity Suppliers (with microgrid specific disclosure additions and modifications), not those of Electric Companies, and that customers within a microgrid will be afforded the same protections from the Commission as those offered to other District electricity customers, with a few microgrid-specific additions. As an example, MRC points out a microgrid customer's place on the critical load / islanding list. For instance, disclosure that your elevators, garage, HVAC, ground floor grocery, and local fire station may stay powered in the island, however your unit's outlets would not be included, and that the microgrid's customers with high power reliability needs, like the grocery store, might pay more for service to have their load fully included in the island. These dynamics already happen regularly, independent of the microgrid context, and such treatment does not in and of itself create new "rate classes" as it is well within the commercial contracting authority of such private parties and not the subject of an open access, publicity available tariff.

E. OPC believes these considerations need to be addressed but in a formal rulemaking.

Comments on RPS and Fuel Mix/Emissions Requirements

A. DCCA supports this portion of the recommendation.

B. DOEE disagrees with this portion of the recommendation as written. Electricity imported to the microgrid is already regulated under the RPS, and should not be double-regulated. Generating assets that are owned by the microgrid and from which power is sold by the Microgrid Operator to its customers should be subject to the RPS.

C. EEI supports this recommendation.

D. Grid2.0/DCCUB/Sierra Club supports this portion of the recommendation, but emphasizes that, for microgrids or any other DER with generation capacity, the DCPSC must strive to avoid "stranded emissions". The District is committed to switch to 100% renewable electricity by 2032. Any fossil-fuel electrical generation in DC at that time may violate this requirement.

E. GRID Alternatives MidAtlantic supports this portion of the recommendation.

F. MRC conditionally supports this portion of the recommendation. MRC seeks a modification to the recommendation to clarify that it is the Electricity Supplier retained by a microgrid (or in the alternative PEPCO) that is required to comply with the RPS in connection with the imported power it provides. The microgrid itself (including its microgrid operator / manager) should not be required to procure and submit Renewable Energy Certificates ("RECs") to DCPSC to demonstrate compliance with RPS targets for load meet by onsite DER provided power. Overall, the RPS compliance was designed and scaled for Electric Companies and Electricity Suppliers serving load with imports, as requiring onsite distributed generation meeting onsite load to be RPS compliant would create significant burdens and discourage the deployment of DER generation (which the RPS framework was designed to encourage, with certain DER generation eligible to originate RECs for purchase by compliance entities; the opposite side of the compliance coin)." RPS tier qualifying onsite generation within a microgrid should continue to be allowed to originate RECs (of various types) under the RPS.

G. OPC believes these considerations need to be addressed but in a formal rulemaking

H. WGL Energy does not object to this portion of the recommendation governing the applicability of these RPS and Fuel Mix Emission Requirements as they are part of law that would govern any such project.

Comments on Construction and Permitting

A. DCCA conditionally supports this portion of the recommendation, suggesting that the DCPSC should make a strong case to have oversight of microgrids with non-utility medium voltage of greater than 13.8kV, rather than DCRA.

B. DOEE supports this portion of the recommendation.

C. EEI supports this recommendation with the understanding "that all microgrids should be subject to the same appropriate [construction and permitting] regulations without distinction of voltage, operation or ownership."

D. Grid2.0/DCCUB/Sierra Club supports this portion of the recommendation.

E. Microgrid Architect submits the following proposed change to the recommendation: "If the microgrid has utility-owned medium voltage distribution assets at or above 13.8kV, the assets should be constructed using the same procedures as any other customer-specific distribution investment by the utility, and shall not be unreasonably delayed. However, if there is a distribution asset that is built solely for the purposes of adding a resiliency benefit to potential microgrid customers, and the asset is therefore subject to cost recovery through the utility's rate-base, then the utility is. it must be required to file a Notice of Construction (NOC) and a Certification of Public Convenience Necessity (CPCN)

for the consideration of the DCPSC.“ Microgrid Architect offers the following justification: “In harmony with the revision to [Recommendation 5.3.2], the microgrid and its users will be providing full cost recovery to Pepco for such assets, analogous to how Pepco would charge new construction for any single-customer distribution assets. The CPCN process should only be applicable when other rate-payers are being obligated to cover the costs.”

F. MRC conditionally supports this portion of the recommendation, stating that there should be “normal construction codes with any microgrid-specific modifications required.” MRC states that, “as to CPCN, socializing the benefits of microgrids to ratepayers at large should be done via DSSAs and Resilient Community Services Payments, and microgrid exemptions to CPCN requirements should be developed in the absence of ratepayers being obligated to cover microgrid construction capital expenditures (i.e. in the absence of a hybrid microgrid).

G. OPC believes these considerations need to be addressed but in a formal rulemaking.

H. Pepco believes regardless of voltage, ownership or operation, all microgrids should be subject to the same safety and construction regulations

I. WGL Energy supports this portion of the recommendation and agrees that there should be normal construction codes with any microgrid specific modifications required and that the DCPSC should develop broad categories of exemption of CPCN.

Comments on Safety and Electrical Codes

A. DCCA agrees with part A and B of this portion of the recommendation. DCCA believes that microgrids in Part C should be held to the latest NESC guidelines.

B. DOEE believes that the construction of distribution infrastructure for microgrids should fall under the existing regulatory framework.

C. EEI supports this recommendation with the understanding that all microgrids should be subject to the same appropriate standards and protocols without distinction of voltage, operation or ownership.

D. General MicroGrids supports this portion of the recommendation conditionally, with a big stated condition that this recommendation be reworded and reframed to reflect the consensus reached during the Workshop on the need to create a new regulated entity of “Microgrid Operator.” GMI supports the need for a new regulated entity classification. However, the way in which this Recommendation is currently worded does not reflect the consensus of the parties on the rationale for such a new classification, nor does it address “Regulation” beyond taking up categories of regulation that concern protections, safeguards, restrictions, standards of operation in the public interest under existing utility regulation, based on a taxonomy of “business model classifications” delineated by the Working Group.

E. Grid2.0/DCCUB/Sierra Club supports this portion of the recommendation.

F. Microgrid Architect supports this portion of the recommendation and submits that "safety is safety" and "the standards are the same." Microgrid Architect states that "Pepco receives certain variances that would not apply to non-utility assets, but the NESC is still the correct standard" and this portion of the recommendation addresses the question of who will inspect or enforce the standard.

G. MRC supports this portion of the recommendation and believes "that microgrids should be held to regular industry safety standards for the microgrid side of the point of common coupling. MRC conditions that microgrids should be held to standards that align with their system size, type, voltage level, etc. and not those that were designed for large, open access, public utility distribution networks."

H. OPC believes these considerations need to be addressed but in a formal rulemaking.

I. Pepco believes regardless of voltage, ownership or operation, all microgrids should be subject to the same safety and electric code standards, system protection standards and communications protocols.

J. WGL Energy complies with existing safety codes that apply industry standards but does not support regulations and would object to safety standards that unfairly burden microgrid owners and the microgrid and therefore does not object to this portion of the proposed recommendation.

5.5.4 RECOMMENDATION – DCPSC TO DIRECT THE UTILITY TO ESTABLISH A CUSTOMER MICROGRID SCHEDULE

5.5.4.1 Recommendation

DCPSC should direct the utility to establish a customer microgrid schedule or tariffs. The tariff would be between a microgrid customer and the utility and may include: fixed charges, time-of-use charges, volumetric charges, payments and/or credits for export, and demand charges.

5.5.4.2 Background

WG5 discussed existing net energy metering rules at length and determined that the DCPSC should establish a microgrid tariff for microgrid services that do not fall under the existing net energy metering rules.

In the District, the Net Metering Tariff applies to residential and commercial customers with behind-the-meter generation less than 1 megawatt. If the generating facility has a capacity less than or equal to 100 kilowatts, the excess generation of the facility is credited to the customer at the full retail rate. If the generating facility has a capacity that is greater than 100 kilowatts in size, the excess generation of the facility is credited to the customer at the generation rate. If a microgrid exports to the grid and has a built capacity less than 100% of its annual consumption, the Net Metering Tariff applies. It

was discussed in the working group that if a microgrid exports to the grid and has a built capacity greater than 100% of its annual consumption, than a microgrid tariff could be considered.

Some stakeholders support the creation of a microgrid services tariff to govern services and functions that microgrids may provide to the grid. This may include compensation of microgrid services like reliability, resiliency (Learning 5.5.6 notes the need to define resiliency at the distribution level), and distribution-level ancillary services. Other stakeholders support the creation of a microgrid customer tariff to govern services and functions that microgrids may provide to its customers. This may include protections for customers in the microgrid and the system, such as standby charges, level of service requirements, etc.

OPC has referred to microgrid tariff and regulations developed in Puerto Rico to learn from when exploring a tariff in the District. The primary outcome of the regulations in Puerto Rico is the three allowable ownership structures (Personal, Cooperative and Third-Party Microgrids). The rules in Puerto Rico determine who is allowed to own microgrids and set specific rules around who can sell excess energy and services to others. Personal and Cooperative Microgrids are able to provide excess energy and grid services to neighboring customers and others while Third-Party Microgrids who serve multiple customers are subject to rate regulation and can earn a reasonable rate of return for the first three years of operation.

5.5.4.3 Stakeholder Positions

A. AOBA states its position "that microgrids should be paid for by the people that utilize and receive the benefits of those microgrids" and "the costs of microgrids should not be a generalized ratepayer expense." AOBA believes that "efforts should be made to encourage private sector investment in microgrids and to avoid procedures, policies and regulations that might inhibit affordable interconnection with the utility distribution system."

B. DCCA supports this recommendation.

C. DCSEU supports this recommendation – DER value streams should be clearly established, and regulation should ensure avenues for DER to receive compensation as appropriate for value delivered to the grid and to society.

D. DCSUN abstains from stating a position.

E. DOEE believes that "tariff schedules have to be put in place for microgrids that account for the resilience benefit provided by the microgrid to the grid, and the value that the grid provides to the microgrid, taking into account the two-way flow of power." DOEE clarifies that the "existing net metering rules are not adequate to include systems above the 100% annual consumption." DOEE states "microgrid operators may earn money on grid export under a microgrid tariff." DOEE stated that "a microgrid tariff should be a valuation of all benefits provided to the macrogrid by the microgrid and all benefits provided to the microgrid by the

macrogrid. DOEE's original intent in recommending a tariff schedule to cover microgrids was in order to allow for the full compensation of services that microgrids provide. In the absence of a local distribution services market, this will not be possible without designating an appropriate tariff schedule that takes the full value of a microgrid into account. DOEE recommends reviewing the filing in HI governing the creation of a microgrid services tariff. DOEE conditionally supports this recommendation, stating that the tariff schedule should not only cover exports, "but the two-way energy flow between microgrids and the distribution grid." DOEE strongly objects to the decision by SEPA to remove the resilience value language as a potential part of the microgrid tariff schedule, a few hours before the submission of stakeholder position comments on May 22, when SEPA clearly and strictly instructed the stakeholders that the stakeholders will not be allowed to suggest changes to the recommendation language after May 8. Resilience value is a critical part of the value stack of microgrids. DOEE believes it is untenable to create a microgrid tariff that does not capture, in some way, the value of resiliency. DOEE certainly recognizes the challenge of determining a resilience value for all projects, but we believe that the Commission must make an attempt to assign a resiliency value, if not for all types of microgrids, than at least for some types of microgrids. For example, valuing resiliency may be easier to determine for commercial operations, i.e. loss of revenue, than for residential projects. Furthermore, resilience value could be taken into account in the locational value of DER framework. DOEE proposes that the Commission adopt a nominal flat rate of $0.01/kWh of resilience in the interim, until a resilience value framework is sufficiently developed.

F. EEI supports this recommendation but also notes that, when establishing a tariff, it is important to pay special attention to avoiding cost-shifting between customers of the microgrid and other customers and making sure that it includes protections for customers in the microgrid and the broader distribution grid. Microgrids can provide multiple services to the macrogrid, and can act in the role of recovery and re-energization of the distribution grid after a blackout ("self-healing"). Microgrids can improve local management of power supply (potentially acting as an NWA), which has benefits across the distribution system. Resilience valuation is not new, and there are multiple potential calculations of resilience value. A report by NARUC (https://pubs.naruc.org/pub/531AD059-9CC0-BAF6-127B-99BCB5F02198) studied four such options: contingent valuation, the defensive behavior method, the damage cost method, and input-output modeling.

G. General MicroGrids opposes this recommendation, as revised on May 22, 2019 [removing "resiliency benefits" from potential services under tariff]. General MicroGrids recommends that the recommendation include the following wording at the end of the Recommendation: "and resiliency and other benefits and services."

H. Grid2.0/DCCUB/Sierra Club supports this recommendation, subject to the reservations expressed in comments for Recommendation 5.5.1, 5.5.3 and 5.5.5.

I. GRID Alternatives MidAtlantic conditionally supports this recommendation. Any customer microgrid schedule or tariffs must enable equitable access for low-income and disadvantaged communities.

J. MRC conditionally supports and opposes parts of this recommendation. MRC "agrees that a microgrid tariff enabling DSSAs, including those related to dispatchable export, islanding, and demand reduction services is important." Overall, MRC supports the creation of a microgrid tariff to govern services and functions that microgrids may provide to, and receive from, PEPCO. Such tariff should also avoid any restrictions on microgrids providing wholesale products and services to PJM. Beyond MRC support for the contractual disclosure and other requirements set forth above in its stakeholder positions, MRC opposes a microgrid tariff that governs rates, services, and functions that microgrids may provide to their customers as being too prescriptive and a recipe for effectively blocking third-party microgrid development and finance. MRC notes that Puerto Rico is experiencing difficulty with rate regulation hindering third-party microgrid development and finance. While Puerto Rico may endeavor to continue down the path of rate regulation for multi-customer, third party microgrids, any success will likely be derivative of the very high ambient PREPA default rates (at times double those of the District's) and the associated ease of providing high, market-reasonable, cost plus-based rate floors for third-party developers, and not of the efficacy of a microgrid rate regulatory regime at enabling the flow of private capital. MRC further notes that a microgrid pilot project regarding DSSAs and microgrid tariff design can explore the exchange of services between a microgrid and PEPCO.

K. NCS has concerns with the potential for fixed and/or demand charges and how they may impact the volumetric benefits of solar energy. Should these elements be taken into consideration by the commission we believe it is important to value the benefits solar energy and/or microgrid is providing to the grid in its ability to alleviate demand on the grid.

L. OPC conditionally supports this recommendation; however, there must be a statement regarding that microgrid users not ratepayers would be responsible for stranded costs. And a clear disclosure to participants who utilize a microgrid, must pay for stranded costs related to fixed investments incurred to serve them. OPC also proposes that the recommendation be "DCPSC should direct Pepco to propose a microgrid services tariff to DCPSC and stakeholders for review and comment." OPC suggests that DCPSC look at components of HECO and Puerto Rico to include in the background section.

M. Pepco supports this recommendation with the following qualifications:

    a. The use of the term 'Customer Microgrid' in this recommendation is confusing. Pepco understands this recommendation to call for the creation of a tariff between Pepco, as the grid operator in the District, and any islandable entity, namely a microgrid of any size or type. As such, the

description of the items that could be included in such a tariff should additionally include the obligations of the islandable entity to Pepco including but not limited to:

i. Performance standards
    1. Distribution system operation - In conformance with Pepco standards for operation (call center support, emergency outage restoration, emergency response)
ii. System maintenance requirements
iii. Cost recovery provisions
iv. Customer billing - Standby service charge provision
v. Dynamic rates at which microgrid operators will be reimbursed for exports to the grid Notice of intention to voluntarily island
vi. Pepco visibility into and limited control of the microgrid to assure safety and grid-wide reliability
vii. Response time criteria and penalties for non-performance if a microgrid asset is serving as an NWA.

b. A second model tariff should be designed to set guidance for the interactions between microgrid operators and their customers. Pepco recommends that the foundational elements of this model tariff between a microgrid operator and its customers be prepared via a working group process. Though some may argue that bilateral contracts are enough to address these interactions between microgrid operators and their customers, this argumentation implies that microgrid customers who are dissatisfied with the services they are receiving must depend on the courts for relief. However, electric service expertise resides with the Commission.

N. Sunrun abstains from stating a position.

O. WGL Energy notes that this recommendation as presently worded is confusing. To the extent that the recommendation is referring to a utility tariff governing its customers that are microgrid operators WGL Energy agrees with its intent but suggests that the recommendation be reworded as follows: DCPSC should require the utility to propose a tariff that governs microgrid operators that need to purchase utility services or provide services to the utility. The tariff would be between a utility customer that is a microgrid owner and the utility and may include: fixed utility charges/rates, time-of-use utility charges/rates, volumetric utility charges/rates, utility payments to the microgrid owner and/or rate credits for power exported to the grid power generated on the microgrid, utility demand charges/rates and resiliency benefits contributed to the grid by the microgrid.

5.5.5 RECOMMENDATION – DCPSC TO DETERMINE HOW UTILITIES RECOVER COSTS OF MICROGRID ASSETS

5.5.5.1 Recommendation

DCPSC should determine how utilities recover costs of microgrid assets. Stakeholder input from the working group around cost recovery of microgrid assets led to the following recommendations:

A. Distribution assets within the microgrid that are owned by the utility should be considered regulated assets subject to cost recovery through the utility's ratebase

B. Distribution assets built solely for the purposes of adding a resiliency benefit to a potential microgrid that benefits all ratepayers is subject to cost recovery through the utility's ratebase.

C. Distributed generation assets within the microgrid that are owned by a third-party or customer should be allowed to provide grid reliability services to the utility via a NWA contract.

5.5.5.2 Background

Stakeholders determined that the cost recovery mechanisms of the individual assets within the microgrid depend primarily on the entity who owns/operates the asset and the application of the asset. During the November 2018 WG5 meeting, stakeholders reached general agreement that Single Customer Microgrids and Third Party Campus Single Customer Microgrids should require limited regulatory oversight as it is composed of DER and retail electricity contracts directly between a microgrid customer and a third-party. During the January and February 2019 WG5 meetings, stakeholders further discussed utility cost recovery for hybrid microgrids.

5.5.5.3 Stakeholder Positions

A. DCCA partially supports this recommendation:

   a. DCCA states that "given the advent of advanced inverter technology and the multiple, grid-serving functions that are required of them under the IEEE 1547-2018 (1547.1 and UL protocols) standards adopted by the DCPSC in its rule-making on Interconnection of January of 2019, it is unrealistic to imagine an investment in a microgrid justified simply on a "resiliency" basis, and not on the basis of multiple benefits to the grid that accrue to customers and society. This recommendation needs to be reworked accordingly as MEDSIS is future oriented. Inter alia, the recommendation needs to address the following. What if the utility owns a microgrid built for the sole purpose of resiliency, and the microgrid has multiple purposes - resiliency plus e.g., voltage stabilization or peak shaving? Then would it be rate-based? And what if it officially according

to the utility, has one purpose, resiliency, but in practice has two or more functions? Then can Pepco rate-base it because the utility officially built it only for resiliency? These questions need to be cleared up."

b. DCCA recommends the "need for MEDSIS to define "resiliency." We recommend that no Working Group suggestion centered on "resiliency" should be regarded as a "recommendation" until such a definition is agreed upon and regulatory implications examined. Further, the DCPSC should embark upon a definition for resiliency at its earliest convenience or charge MEDSIS working groups to do so."

c. DCCA states that there is "no need for [Section 5.5.5.1.C] as third parties are already allowed to provide such services.

B. DOEE "cannot agree at this time to a blanket approval of ratebasing all microgrid distribution infrastructure the utility would own. Rather, DOEE suggests that PSC propose draft cost recovery rules for ratebasing utility-owned microgrid distribution infrastructure." DOEE believes that the statement in [5.5.3.1.C] "is not needed because there are no rules prohibiting a 3rd party owned microgrid to sell grid services to the utility through a contract (which is NOT an NWA contract--but a regular service performance contract)." DOEE states that "bilateral contracts can be drawn up between Pepco and the microgrid operator for ancillary services." DOEE believes that "if a microgrid is contracted to the utility as an NWA that will be addressed under changes to the regulatory model under PBR."

C. EEI supports this recommendation.

D. General MicroGrids conditionally supports this recommendation. General MicroGrids supports the recommendation that the DCPSC evaluate how utilities may recover costs of investments in microgrid assets, but believes that the sub-recommendations are judgmental and may be subject to particular circumstances and policy considerations. For example, whether a utility can recover its investment in the distribution assets of a microgrid as a regulated asset may well depend on the merits of the microgrid system as a whole and not just with respect to investing in certain component parts; whether "all" utility ratepayers need to benefit from microgrid distribution assets built to provide resilience benefits for a utility to obtain appropriate cost recovery merits further consideration; "Distribution generation assets" (owned by third parties/customers) should not be the only assets identified as qualifying for a NWA contract to provide grid reliability services.

E. Grid2.0/DCCUB/Sierra Club conditionally supports this recommendation. Grid2.0/DCCUB/Sierra Club agree that the DCPSC should establish a tariff for microgrid power export, to the grid, and that there should be provisions for the utility to ratebase infrastructure necessary to the function of the microgrid. We believe that that the tariff should address the flow of energy flow both into and out of microgrids. We also assert that he resilience benefit provided by the microgrid to the grid should have a value - though criteria for that calculation requires

additional discussion between developers, the utility, public interest advocates, and the DCPSC.

F. Microgrid Architect supports this recommendation.

G. MRC conditionally supports and opposes parts of this recommendation. MRC supports A, on the condition that a hybrid microgrid's users bear the majority of the utility's recovery costs for such microgrid's use of the utility-owned distribution assets. MRC opposes B., suggesting that public purpose / resiliency values "be addressed exclusively through Resilient Community Services Payments." MRC "supports PEPCO's ability to earn on Distribution Support Service Agreement costs and that DSSAs can be NWAs." Overall, MRC suggests that building DSSA stacks and associated advanced distribution control technology deployments represent PEPCO's most significant microgrid-related "regulatory assets" that should be subject to cost recovery and earning via ratebase. Again, MRC believes DSSAs and Resilient Community Services Payments represent the most effective and efficient method of ensuring microgrids benefit all District ratepayers.

H. OPC does not support this recommendation and supports DOEE's reasoning. Furthermore, microgrids may not be the best solution used by a utility as a more cost effective solution may exist and determining what's going to be rate based at this juncture is premature.

I. Pepco supports this recommendation and notes that distribution assets that add resiliency that benefits all ratepayers can only benefit from direct inclusion in utility ratebase if the assets are owned and operated by the utility. If distribution assets are owned and operated by any non-utility entity (which undercuts the foundation for all utility regulation in the District), then they would not be subject to direct utility ratebase treatment. Rather, the public resiliency benefit afforded by these assets would need to be valued and reimbursed by the District government via a direct procurement.

J. Sunrun abstains from stating a position.

K. WGL Energy does not object to this recommendation as long as it is not intended to imply that utilities may own generation assets in a microgrid.

5.5.6 LEARNING – NEED FOR DEFINING RESILIENCE AT THE DISTRIBUTION LEVEL

5.5.6.1 Background

Stakeholders identified the need for further defining resilience as it has been discussed when determining appropriate components of a microgrid schedule and appropriate cost recovery mechanisms. In order to appropriately develop rules around cost recovery and compensating resiliency value, the working group recognizes that the DCPSC should first adopt or define a definition of resilience specific to the energy distribution system in

the District. The working group discussed several definitions from the industry including from organization such as IEEE, EPRI, NARUC, US DOE, MRC, DOEE and the Institute for Policy Integrity. The MEDSIS Consultants and working group conducted a literature review on reports relevant to the definition and value of resilience to submit for the DCPSC's review on the matter.

- RAP's Regulatory Approaches to Grid Resiliency and Security[33]
- Institute for Policy Integrity's Toward Resilience, Defining, Measuring, and Monetizing Resilience in the Electricity System
- DOEE's Resilience Strategy[34]
- PNNL's Electric Grid Resilience and Reliability for Grid Architecture[35]
- Argonne National Laboratory's Front-Line Resilience Perspective: The Electric Grid[36]
- EEI's Before and After the Storm: A compilation of recent studies, programs, and policies related to storm hardening and resiliency[37]
- LBNL's Evaluating Proposed Investments in Power System Reliability and Resilience: Preliminary Results from Interviews with Public Utility Commission Staff[38]
- NREL's Valuing the Resilience Provided by Solar and Battery Energy Storage[39]
- NARUC's The Value of Resilience for Distributed Energy Resources: An Overview of Current Analytical Practices[40]
- MRC's Microgrid and Grid Resiliency Filing[41]

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[33] https://www.raponline.org/wp-content/uploads/2017/01/rap-jmo-dl-ra-regulatory-approaches-grid-resiliency-security-2017-jan.pdf

[34] https://app.box.com/s/d40hk5ltvcn9fqas1viaje0xbnbsfwga

[35] https://gridarchitecture.pnnl.gov/media/advanced/Electric_Grid_Resilience_and_Reliability.pdf

[36] https://www.energy.gov/sites/prod/files/2017/01/f34/Front-Line%20Resilience%20Perspectives%20The%20Electric%20Grid.pdf

[37] http://www.eei.org/issuesandpolicy/electricreliability/mutualassistance/Documents/BeforeandAftertheStorm.pdf

[38] https://www.energy.gov/sites/prod/files/2017/01/f34/Evaluating%20Proposed%20Investments%20in%20Power%20System%20Reliability%20and%20Resilience%20Preliminary%20Results%20from%20Interviews%20with%20Public%20Utility%20Commission%20Staff.pdf

[39] https://www.nrel.gov/docs/fy18osti/70679.pdf

[40] https://pubs.naruc.org/pub/531AD059-9CC0-BAF6-127B-99BCB5F02198

[41] http://www.microgridresources.com/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=e0cc66bb-8717-b886-236f-5a2b927596de&forceDialog=0

5.5.6.2 Conclusion

There is a need in the District for the DCPSC to define or adopt a definition of resilience at the distribution level and add it to the existing list of MEDSIS definitions in FC1130. The following definitions have been submitted by the working group for DCPSC consideration:

A. **IEEE Resilience Definition:** The ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to and/or rapidly recover from such an event.

B. **EPRI Resilience Definition:** Resiliency describes hardening the system to withstand and to recover quickly from high-impact, low-frequency events that result in power system outages

C. **NARUC Resilience Definition:** Robustness and recovery characteristics of utility infrastructure and operations, which avoid or minimize interruptions of service during an extraordinary and hazardous event (Keogh & Cody, 2013). Resilience is not the same as reliability. While minimizing the likelihood of large-area, long-duration outages is important, a resilient system is one that acknowledges that such outages can occur, prepares to deal with them, minimizes their impact when they occur, is able to restore service quickly, and draws lessons from the experience to improve performance in the future. (National Academies, 2017, p. 10)

D. **US DOE Resilience Definition:** The ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions, including the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents.

E. **MRC Resilience Definition:** The ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to, and/or rapidly recover the functioning of critical infrastructure to sustain essential services for communities during and following such an event.

F. **DOEE Resilience Definition:** Urban resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and thrive no matter what kinds of chronic stresses and acute shocks they experience.

G. **Institute for Policy Integrity Resilience Definition:** Grid resilience is the electric grid's ability to resist, absorb, and recover from high-impact, low-probability external shocks.

H. **National Infrastructure Advisory Council's (NIAC) Resilience Definition[42]:** Infrastructure resilience is the ability to reduce the magnitude and/or duration of disruptive events. The effectiveness of a resilient infrastructure or enterprise

[42] https://www.dhs.gov/sites/default/files/publications/niac-critical-infrastructure-resilience-final-report-09-08-09-508.pdf

depends upon its ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event.

I. **Federal Energy Regulatory Commission's (FERC) Resilience Definition[43]:** The ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to, and/or rapidly recover from such an event.

J. **Presidential Policy Directive 21 (PPD-21) Resilience Definition[44]:** The term "resilience" means the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents

5.5.6.3 Stakeholder Positions

A. DCCA Comment on "Learning Conclusion": DCCA believes that the DCPSC will be able to formulate a definition for "resilience" from the many examples provided in the Learning.

B. DCSEU supports this recommendation conditionally as resilience is not a microgrid-specific issue and should be an integrated part of system planning for the grid at large.

C. DOEE does believe that a practical approach to valuing resilience may be available, even if it may differ depending on the customer class. Resilience, like DER, has a value that is both locational and time-dependent. There are other jurisdictions that have begun to tackle this problem by assigning a $0.01/kWh value to resilience in the meantime while putting together a more robust framework for the valuation of resilience. Regarding a resilience definition, DOEE does not favor one particular definition over the others, but recommends that the DC Office of Resilience definition is included: "Urban resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and thrive no matter what kinds of chronic stresses and acute shocks they experience."

D. EEI acknowledges this learning but warns against conflating a definition with its ability to be measured, quantified, monetized, or compensated. When adopting a definition, special attention should be given to consistency with the definition adopted by relevant organizations such as FERC, NARUC, and DHS, among others.

E. General MicroGrids supports this learning activity and especially concurs with MRC and DOEE that the definition and consideration of "resilience" at the

[43] https://www.ferc.gov/CalendarFiles/20180108161614-RM18-1-000.pdf

[44] https://obamawhitehouse.archives.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil

Distribution Utility level extend beyond the parameters of the power system and include the protection and functioning of critical infrastructure and essential services within communities. Moreover, consideration of resilience at the Distribution level should be interrelated with consideration of resiliency at the Transmission level, including coordinated planning, risk/threat assessments; response, mitigation, and restoration strategies.

F. Grid2.0/DCCUB/Sierra Club support the learning and favors the NARUC definition that cites the National Academies definition: Resilience is not the same as reliability. While minimizing the likelihood of large-area, long-duration outages is important, a resilient system is one that acknowledges that such outages can occur, prepares to deal with them, minimizes their impact when they occur, is able to restore service quickly, and draws lessons from the experience to improve performance in the future.

G. GRID Alternatives MidAtlantic / NCS note that some submitted definitions focus on the physical distribution system and its operation, while others are more general, and DOEE's expressly extends to "the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and thrive no matter what kinds of chronic stresses and acute shocks they experience." Overall, the broader scope of resilience definitions is preferable, to include not just the grid but also the people, organizations, and communities it serves.

H. MRC supports its definition of resilience set forth above and the use of Resilient Community Service Payments to capture resiliency value. MRC believes resiliency manifests at the local level by supporting the operations of critical facilities providing essential services to communities in an emergency. DSSAs can indirectly support resiliency by giving PEPCO the dispatchable tools to help avoid distribution network disruptions under black sky scenarios and to optimize grid operations under blue skies.

I. OPC is neutral on this learning.

J. Pepco acknowledge this learning and suggests the prudency of the District adopting a definition for resilience to apply to the grid that is consistent with the language used by trusted national entities with energy system expertise such as: FERC, NIAC, USDOE, IEEE, EPRI, and NARUC.

5.5.7 RECOMMENDATION – DCPSC TO AMEND CURRENT INTERCONNECTION RULES TO ADDRESS INTERCONNECTION AND ISLANDING RULES FOR MICROGRIDS AND STORAGE

5.5.7.1 Recommendation

DCPSC should define how microgrids fit into existing Interconnection categories or if additional categories are required. Interconnection and Islanding rules for microgrids

must be established to address islanding capabilities and the controllable exports and imports of microgrids.

5.5.7.2 Background

During the December 2018 and January 2019 WG5 meetings, stakeholders agreed that the owners of the distributed generation and energy storage assets of a microgrid system should be required to follow the latest Interconnection Standards and Process, according to the system's capacity. During the February 2019 WG5 meeting, the majority of stakeholders believed that microgrids should not be allowed to export during islanded mode. A group of stakeholders stated that this topic requires further investigation by DCPSC.

5.5.7.3 Stakeholder Positions

A. DCCA does not support this recommendation. DCCA does not think this recommendation is necessary. The interconnection issues relating to islanding and storage are addressed by the new IEEE 1547-2018 Standard for advanced inverter technology and its grid facing functionalities adopted by the DCPSC in its January 2019 interconnection rule-making. The DCCA Proposal for a Stakeholder Working Group on deployment of IEEE 1547-2018 Standard regarding advanced inverters would logically address microgrid aspects in selecting functionalities under the new Standard and recommend to the DCPSC accordingly. See Appendix No. A6.1 and Recommendation 5.2.7.

B. DCSEU supports this recommendation – islanding capabilities need to be considered and interconnection rules should be amended to account for this.

C. DCSUN abstains from stating a position.

D. DOEE conditionally supports this recommendation. Interconnection rules will require new models for systems with storage and/or islanding capability. The PSC should also study the potential for flexible interconnection in instances where hosting capacity may be insufficient only at certain times of day on a given feeder. The interconnection process should be streamlined as much as possible, with transparency in both process and the itemized cost of required grid upgrades. PSC has a critical role to play in ensuring that interconnection charges are not overly burdensome, because this could actually promote grid exit.

E. EEI supports this recommendation but notes that exports of electricity to the grid are not an inherent trait of all microgrids.

F. General MicroGrids supports this recommendation. General MicroGrids would recommend adding the following language to the recommendation: In evaluating the need to amend interconnection rules and addressing islanding, the DCPSC should take into account IEEE standards that have become effective, including IEEE 2030.7 and 2030.8 relating to standards and testing procedures for microgrid controllers.

G. Grid2.0/DCCUB/Sierra Club support this recommendation.

H. GRID Alternatives MidAtlantic supports this recommendation.

I. MRC conditionally supports this recommendation. MRC states that interconnection standards for a microgrid's distributed generation and energy storage should be "adjusted for the range of controllable exports and imports." As to reconnection and exporting from island mode, the MRC stated that "microgrids only reconnect from island when they confirm the distribution grid is up and ready to synchronize (if not you would feed a dead bus, the generators would trip off with low voltage or frequency and it would create restoration crew risk). A microgrid has the advantage of being able to reconnect energized and in sync without putting added load onto a substation. It allows for the substation / circuit to be pulled back up online without having as much load to lift. After the substation is up, then you can reconnect the microgrid and start importing to the microgrid / adding load on the substation or exporting to the substation with extra generating / storage capacity to support the utility's restoration efforts (i.e. free up line capacity elsewhere, among other things). However, in the future, a utility equipped with an advanced DERMS / ADMS equipped network and better substation controls and switching could dispatch a microgrid to reconnect and export out of island mode and have its power join other sources supplying the substation and help bring it back online. In this future scenario, the microgrid master controller and the DERMS controller would communicate and balance to ensure the microgrid doesn't trip and lose its island when providing this service."

J. NCS supports this recommendation.

K. Pepco supports this recommendation and notes that safe exports require utility visibility and limited utility control.

L. Sunrun abstains from stating a position.

5.5.8 RECOMMENDATION – DCPSC AND D.C. TO MODIFY METHODOLOGY FOR CALCULATING DCPSC AND D.C. LAW SURCHARGES ON DISTRICT CUSTOMERS' BILLS

5.5.8.1 Recommendation

A. The D.C. Council should explore the need to modify the current methodology of calculating the Energy Assistance Trust Fund[45], Sustainable Energy Trust Fund[46] and Public Space Occupancy Surcharges[47] so that a customer's off-setting consumption by on-site generation is fairly calculated to support the public policy

[45] Statute directs the D.C. Council to set specific volumetric rates in DC Code Section 8-17774.11.

[46] Statute directs the D.C. Council to set specific volumetric rates in DC Code Section 8-17774.10.

[47] Statute authorizes the D.C. Council to establish a surcharge in DC Code Section 10-1141.06 and directs D.C. Council to set a value for a surcharge in DC Code Section 10-1141.0.

goals reflected in the charges. Modification options may include calculating surcharges by peak demand, peak import, or average import. This recommendation requires legislative change and coordination between DCPSC and D.C. Council.

B. The DCPSC should modify the current methodology of calculating the Residential Aid Discount Surcharge[48] to be calculated in a manner similar to how the other DCPSC-set surcharges are calculated[49].

5.5.8.2 Background

Stakeholders have discussed in detail how DCPSC and D.C. Law surcharges should be treated for microgrid customers to ensure the affordable and non-discriminatory principles of the MEDSIS Vision Statement are maintained during the development of microgrids in the District. Stakeholders mentioned that the DCPSC coordinates this recommendation with the ongoing RM9 Working Group on Net Metering.

During WG5 meetings, stakeholders discussed how the DCPSC and D.C. Law mandated surcharges should be applied to microgrid customers' bills. The discussion evolved into a broader conversation around the need to modify how these surcharges are currently being calculated. Figure 5.14 below illustrates an example Pepco DC bill.

Type of charge	How we calculate this charge	Amount($)
Distribution Services:		
Customer Charge		15.09
Exelon Base Rate Credit		2.09–
Energy Charge	First 400 kWh X $0.0121400 per kWh	4.86
Energy Charge	Last 145 kWh X $0.0196700 per kWh	2.85
Residential Aid Discount Surcharge	545 kWh X $0.0004420 per kWh	0.24
Administrative Credit	545 kWh X $0.0000000 per kWh	0.00
Subtotal (Set by DC PSC)		**20.95**
Energy Assistance Trust Fund	545 kWh X $0.0002322 per kWh	0.13
Sustain Energy Trust Fund	545 kWh X $0.0016120 per kWh	0.88
Public Space Occupancy Surcharge	545 kWh X $0.0020900 per kWh	1.14
Delivery Tax	545 kWh X $0.0070000 per kWh	3.82
Subtotal (Not set by DC PSC)		**5.97**

Figure 5. 14 – Example Pepco Bill

Credit: Pepco

The Residential Aid Discount Surcharge is set by the DCPSC and is currently calculated by each customers' net volumetric consumption in kilowatt-hours. The Energy

[48] Statute directs the DCPSC to establish programs in DC Code Sections 8-1774.14 and 8-1774.15.

[49] In Formal Case 1120 and 1127, the DCPSC established the programs and the surcharge methodology.

Assistance Trust Fund, Sustainable Energy Trust Fund and Public Space Occupancy Surcharge are set by the D.C. City Council and are also calculated by net volumetric consumption.

5.5.8.3 Stakeholder Positions

A. DCCA abstains from stating a position. DCCA believes in principle that all ratepayers should contribute to low-income programs. However, it is not clear what role the DCPSC would have in this area of policy.

B. DCSUN opposes this recommendation. While these fees are extremely important, benefit ratepayers and addresses the goal to make energy more accessible and affordable to the district, this recommendation fails to capture how all of the changes to the grid that we are recommending in this document will affect the collection of these surcharges, it does not incorporate any marginal studies to determine whether the Commission should see this as a widespread problem, it does not consider the small percentage of ratepayers with behind the meter generation and the actual effects on collecting these surcharges, and it was not discussed in the appropriate working groups (Customer Impact, Rate Design or NWA). Further, it has the potential to target solar customers and discourage environmental and modernized ways of consuming electricity. DCSUN objects to this Recommendation and recommends that it be stricken from this document.

C. DOEE abstains from stating a position and states they are “waiting to better understand the implications”. DOEE states that it will generally abstain on any issue requiring a legislative change, and therefore if this requires a legislative change, they abstain on this issue.

D. EEI supports this recommendation.

E. General MicroGrids supports this recommendation conditionally concurring with MRC that such surcharges should apply to power imported by microgrids.

F. Grid2.0/DCCUB/Sierra Club support this recommendation and note that the example Pepco DC bill is missing the new Underground Project Charge, but it clearly shows that RAD, EATF, and SETF surcharges are based on kilowatt-hours. This may lead to considerable unintended cost-shifting as the District grid moves toward increased sustainability, thereby violating MEDSIS principles for affordability and non-discrimination. We recommend that the DCPSC, working with stakeholders, should review the current methodology of calculating the RAD, Underground Project, EATF, SETF, and Public Space Occupancy surcharges so that the microgrid or generating DER customer’s off-setting consumption by on-site generation are fairly charged for the value of being interconnected to the grid, in compliance with MEDSIS principles and anticipating rapid growth of such non-traditional interconnections within the District. If found to be flawed, modified basis to calculate surcharges may include, but should not be limited to peak demand, peak import, or average import. The fair basis for these charges may

differ, based on whether the charge is for a program that supports the grid infrastructure (Public Space, PLUG) or supports a public goal (RAD, EATF, SETF).

G. GRID Alternatives MidAtlantic / NCS does not support this recommendation in its entirety as written. The stated goals for DCPSC's exploration of surcharge calculation methodologies do not appear to sufficiently value the benefits of on-site generation. While the public policy goals reflected in the charges are of utmost importance, the DCPSC should ensure that the charges do not present some of the same challenges to DERS as standby charges. Whether customers are charged "fairly" should account comprehensively for equity concerns as well as for non-energy benefits such as the environmental, health, safety, career and social benefits of DERs. GRID Alternatives Mid-Atlantic / NCS does not oppose DCPSC assessment of its current methodologies for calculating these surcharges, consistent with other recommendations and in coordination with the D.C. Council and other stakeholders. This recommendation also seems more appropriately placed under Customer Impacts than under Microgrids.

H. Microgrid Architect supports this recommendation and states that these surcharges should be applied to grid imports and suggests the charges be based on kW rather than kWh. Microgrid Architect further offers additional language for justifying this modification: "to avoid double-charging microgrid customers, any new methodology should take into account that microgrids may on their own initiative be meeting the objectives of the surcharges, through lower emissions, contractual accommodations for low-income residents, and so on, and in such cases should only be applicable to grid imports."

I. MRC conditionally opposes this recommendation, stating that "public benefit / policy related surcharges should function normally as non-bypassable for a microgrid's imported power and based its overall import ranges and volumes." However, MRC states that "such surcharges should not be calculated using onsite DER / self-generation."

J. OPC acknowledges that there is a current methodology of calculating the Energy Assistance Trust Fund, Sustainable Energy Trust Fund and Public Space Occupancy Surcharges; however, at this time OPC cannot take a formal position on whether exploration of modifying the calculation methodology is appropriate at this time. OPC does express concern with the options delineated above for changing said methodology as it is not an illustrative list of all methodologies available for recalculation. And OPC would hope that any recalculation would result in a benefit to consumers who pay several surcharges in the District already.

K. Pepco supports this recommendation but notes that the term 'system benefit charge' may be confusing. For the purposes of this recommendation, Pepco understand this term to mean the types of specific programs listed in the body of this recommendation. System benefit charges are not intended in this

recommendation to capture theoretical constructs by which a microgrid could be paid for 'services' it performs for or 'benefits' it affords to the grid.

L. Sunrun opposes this recommendation.

M. WGL Energy supports this recommendation conditionally. WGL Energy supports a demand based rate and agrees that it makes sense that customers with net metering, DER, or in microgrids can see the benefit of their investments in lowering their use of the grid. WGL Energy believes the subsidies should be supported by all customers and having a demand calculation will allow the benefits of onsite generation to reside with the customers, but still have them support these subsidies. WGL Energy notes that the specific surcharges may not be appropriately attributed in this recommendation and identified the need to change the subtitles to more accurately reflect the source of the policy or the calculation of the amount - whether it is set by the DCPSC or DC Counsel. WGL Energy supports the calculation of these surcharges on a KW basis instead of KWh. This approach makes sense and is a bit of a compromise approach so that customers with net metering, DER, or in microgrids can see the benefit of their investments in lowering their use of the grid. These are "social subsidies and it seems fair to still have all customers support them. It may make sense in the case of a microgrid to have the demand of the microgrid connection with Pepco get allocated to the customers within the microgrid. This allows the benefits of the onsite generation to reside with the customers, but still have them support these subsidies. This approach is similar to the view for an individual customer with net metering.

5.5.9 LEARNING - NEED TO REFINE A CUSTOMER COMPLAINT PROCESS FOR ASSETS THAT ARE LEASED OR OPERATED BY THIRD-PARTY

5.5.9.1 Background

OPC and DOEE proposed to the group a need to develop an appropriate process for District consumers interested in becoming a DER or microgrid customer and an appropriate complaint process for addressing consumer issues arising from DER or microgrid third-party leasing and operation. Microgrid developer industry stakeholders suggested this process can inform DCPSC of a breach of consumer protection and disclosure requirements. In the March 2019 WG5 meeting, OPC pointed out there is a customer complaint process that already exists and the working group generally agreed this process should be refined and re-evaluated given the proliferation of DERs.

5.5.9.2 Conclusion

All stakeholders agreed that regardless of whether the DER system is within a microgrid or not, there is need in the District for a well-thought out customer complaint process for assets that are leased or operated by a third-party. Stakeholders identified there is an

existing process that the DCPSC should refine and reevaluate given the proliferation of DERs and increase in customer complaints as described by OPC.

5.5.9.3 Stakeholder Positions

A. DCCA generally supports this learning.

B. DCSUN abstains from stating a position.

C. DOEE does conditionally support this Recommendation but it has been mischaracterized as having proposed this recommendation, which is not the case. This is listed as a joint proposal by DOEE and OPC. DOEE wants to clarify that it does not believe that a customer complaint process is needed merely on the basis that a 3rd party is leasing DER assets. For example, PSC does not need to and should not be reviewing customer complaints over air source heat pumps or solar panels. DOEE emphasizes that this Learning applies only to complex, multi-customer microgrids owned or leased by third party microgrid operator.

D. EEI supports this learning.

E. General MicroGrids concurs with MRC that, while customer protection for microgrids should be addressed, appropriate standards and disclosures can be developed without imposing processes that are part of utility general rate regulation.

F. Grid2.0/DCCUB/Sierra Club support this learning.

G. GRID Alternatives MidAtlantic generally supports this learning, although it seems more appropriately placed under Customer Impacts than under Microgrids.

H. MRC supports this learning and modifying the existing complaint process to address disputes regarding the microgrid-specific contractual disclosures discussed in its stakeholder positions above.

I. NCS is not aware of third-party complaints at this time.

J. OPC supports this recommendation.

K. Pepco supports this learning.

5.5.10 LEARNING - OPPORTUNITY TO LEVERAGE MEDSIS FUNDS TO PILOT MULTI-CUSTOMER MICROGRIDS IN THE DISTRICT

5.5.10.1 Background

During the December 2018 WG5 meeting, Pepco and MRC presented potential business models of different microgrids breaking down ownership/operation structure, financial structure and the potential value proposition of each. Stakeholders generally agreed that microgrid pilots for testing hybrid business models would be a good way to better understand microgrids, the regulations that should be applied to them, and

determine paths that would allow all District residents to benefit from increased community resilience. One model that could be considered is a microgrid operated by the utility with third-party ownership of the generation assets that serves a public purpose benefit. The other model that could be considered is a multi-customer microgrid operated by a third party with distribution assets owned by the utility.

5.5.10.2 Conclusion

Interested stakeholders should develop pilot proposals to test the value proposition, ownership structure and regulatory structure of a Hybrid Multi-Customer Microgrid in which all assets in the microgrid with the exception of distribution assets that are part of Pepco's distribution system are owned by third-parties and/or host customers. The pilot microgrid could explore the appropriate rules and regulations applicable to a "Microgrid Operator" as introduced in Recommendation 5.5.3 and the establishment of a Microgrid Tariff as introduced in Recommendation 5.5.4. The tariff could include what additional costs and charges are appropriate for the microgrid's use of the utility's distribution system as well as operational issues.

The microgrid developer industry stakeholders proposed that the pilot proposal could test the structure and operation of a microgrid that also serves as a NWA, providing grid services to Pepco at locationally constrained areas in the process defined in Recommendation 5.2.3. MRC noted these services could be delivered through a Distribution Support Service Agreement (DSSA). This can occur when a third-party or customer host microgrid operator provides services to the utility in support of distribution system optimization and operation. MRC stated that services under this agreement could include but are not limited to utility call conditions, dispatch processes, pricing and performance requirements. MRC proposed that this pilot project could also explore how the utility can earn on procuring services under a DSSA.

5.5.10.3 Stakeholder Positions

A. DCCA generally supports this learning.

B. DOEE "is open to considering this concept, but recommends prioritizing the development of an enabling framework for a microgrid operator, and having a finalized regulatory process for addressing multi-user microgrids, including a light touch framework." DOEE believes that it is "premature to approve a hypothetical concept for a project, but DOEE is open to considering a concrete pilot proposal processed through the pilot framework."

C. General MicroGrids supports this learning, but would delineate different models to support learning in connection with the development of regulatory reforms that can recognize and monetize the value of benefits and services provided by microgrids to the grid, market, and communities. The first model would be a utility operated multi-customer microgrid, including distribution assets owned by the utility and generation assets owned by third parties/customers; the second

model, a non-utility owned and operated microgrid that could demonstrate the "microgrid as a service" business model.

D. Grid2.0/DCCUB/Sierra Club supports this learning, adding that such pilots should also help establish the fair value of the grid interconnection for public surcharges.

E. Microgrid Architect supports this learning, suggesting that the pilot should focus on privately-owned multi-customer microgrids per new regulatory demonstrations and learnings.

F. MRC supports this learning generally and conditions such support on DCPSC focusing on the following two areas for pilot projects: (1) Testing the value proposition, ownership structure and regulatory structure of a hybrid microgrid serving multiple customers on non-contiguous properties where there is a third-party and utility partnership. Such Hybrid Multi-Customer Microgrid would have a portion of the utility's distribution system incorporated within the microgrid behind the point of common coupling and third-parties and/or host customers owning and operating the generation, storage, and control resources located on the various properties that make up the microgrid. The pilot microgrid should include one or more critical facility (first responder, hospital, pumping station, etc.) loads and thereby be classified as "Public Purpose". Again, MRC suggests all microgrids may be so classified and receive Resilient Community Services Payments if they include critical facility load, so this aspect of the pilot extends broadly. The same pilot could also explore restructuring portions of the Sustainability Energy Trust Fund's programs to provide such payments. The SETF has the opportunity to make the District's communities more resilient in addition to supporting the deployment of renewable energy and energy efficiency. The pilot microgrid would also explore the design of the utility's hybrid microgrid tariff, including what additional costs and charges are appropriate for the microgrid's use of portions of the utility's distribution system. (2) Testing the structuring and operation of Distribution Support Service Agreements (DSSAs) under which microgrids provide services to the utility in support of distribution system optimization / operation. Such a pilot project would explore how the utility and a microgrid would structure the services under a DSSA, including microgrid service descriptions, utility call conditions, dispatch processes, pricing, performance requirements / shortfall LDs, etc. DSSA services under both blue and black sky conditions would also be explored. Utility infrastructure needed to monitor distribution grid conditions and call/dispatch microgrids under DSSAs will also be explored. DSSAs allow the benefits of flexible and dispatchable microgrids to be shared by the community at large via providing the utility with the contractual tools to use microgrids in support of optimizing the distribution system.

G. OPC doesn't support any specific pilot projects.

H. WGL Energy supports both of the models explored in this learning.

5.6 Pilot Projects

6.0 Pilot Projects							
No.	**Recommendation or Learning**	**WG1**	**WG2**	**WG3**	**WG4**	**WG5**	**WG6**
5.6.1	DCPSC to Implement Exclusion Criteria to Pilot Project Selection Process						x
5.6.2	DCPSC Should Implement a Pilot Project Selection Process with Two Step Screening						x
5.6.3	DCPSC to Adopt Grant Funding Qualification Parameters for Pilot Projects						x
5.6.4	DCPSC to Implement a Pilot Projects Governance Model						x

Table 5. 13 – WG6: Pilot Projects Recommendations and Learnings

5.6.1 RECOMMENDATION – DCPSC TO IMPLEMENT PILOT EXCLUSION CRITERIA TO PILOT PROJEC SELECTION PROCESS

5.6.1.1 Recommendation

WG6 recommends the DCPSC implement pilot project exclusion criteria as follows:

1. EE programs should not be excluded as potential pilot projects. .
2. Pilot Projects with unproven technologies should not qualify for MEDSIS funding. WG6 recommends the Pilot Project selection process incorporate the technology screening methodology of Figure 5.15. The working group further recommends that only technologies that score at level 7 or higher qualify for MEDSIS funding and that a risk mitigation plan be included in applicants' proposals for all technologies below level 9.
3. Unregulated subsidiaries of Pepco and Washington Gas Light should not lead pilot projects but should not be prevented from participating in projects.

5.6.1.2 Background

In November 2018, the Pilot Projects working group (WG6) was briefed by John Howley of DCPSC Staff on the proposed MEDSIS grant funding parameters and proposed demonstration projects content from the MEDSIS staff report. The working group then engaged in a discussion into each topic within John's presentation and conducted a "gap assessment" where the group documented areas of consensus and "gaps" or areas requiring more discussion. The full gap assessment is provided in Appendix A.9.

Projects that should be excluded from receiving MEDSIS funding were discussed during the November 2018 meeting and the following results from the gap assessment were noted:

1. Consensus – Energy efficiency (EE) projects should not be excluded, but EE components of pilot projects should be closely coordinated with DCSEU programs.
2. Consensus – MEDSIS funds should be used for technology advancement and not research and development (R&D), funding startups, or commercialization of technologies.
3. Gap – The Customer Impact Working Group (WG4) should provide more detail/ definition around "unproven technologies" by developing a technology readiness metric.
4. Consensus – Unregulated subsidiaries of Pepco and WGL should not lead projects but should not be prevented from participating in projects.

The topic of EE projects received a lot of discussion in the working group meetings. In their Staff Report, DCPSC Staff originally excluded energy efficiency projects because FC1148 was an active case and they did not want to create a situation where budgets allocated to FC1148 and MEDSIS Pilot Projects could be utilized for the same project. Most working group members acknowledged the important role EE can play in optimizing the grid and reducing overall energy usage and peak demand. However, it was discussed that DC has several well-funded EE programs already in place and allocating MEDSIS funding to EE projects may not be the best use of funds. It was discussed that incorporating EE as part of a larger pilot project was a more likely scenario to occur than an EE only pilot project. The working group concluded that energy efficiency is an important form of DER and applicants should be allowed to bring forth energy efficiency related pilot projects so long as those EE efforts are coordinated with the DOEE/DCSEU and any DCPSC instituted EE working group to prevent duplication and inefficiencies

As a follow-up discussion to the gap identified in bullet 3 above, in the January 2019 WG6 meeting, the DOE Technology Readiness model was discussed as a potential metric for evaluating pilot project technologies. Each level of the DOE model was discussed for applicability to the pilot projects anticipated for MEDSIS. As illustrated in Figure 5.15 below, the working group felt only technologies scoring at the highest levels of the scale should be eligible for MEDSIS funding.

Figure 5. 15 – Technology Readiness Level Mapping for MEDSIS Pilot Projects

Credit: WG6: Pilot Projects January 2019 Meeting

5.6.1.3 Stakeholder Positions

A. DCCA conditionally supports the recommendation.
   - DCCA agrees that exclusion criteria need to be established. It opposes criterion "1"allowing energy efficiency (EE) pilot projects but believes that pilot projects that include an EE component should be considered.
   - The exclusion language in criterion "3" should be changed to refer to "Exelon" and AltaGas" instead of their companies Pepco and Washington Gas.
   - Title of recommendation is awkward: change to "DCPSC to Establish Exclusion Criteria for the Pilot Project Selection Process"
   - DCCA supports provision "2" of the recommendation

B. DOEE conditionally supports the provision allowing EE pilot projects and comments, "Because the PSC has a separate merger funding for EE projects in FC 1148, DOEE does not believe that duplicating that funding is necessary using grid modernization funds. Without this funding for grid modernization, there is no other funding source to pilot smart grid-related investments, microgrids, NWAs, hosting capacity related projects, and critical studies related to those issues, such as the Locational Value of DER study. However, there will still be funds for EE projects under FC 1148. Therefore, DOEE believes that grid modernization funds should be reserved for grid modernization projects."

C. EEI supports the recommendation.

D. General MicroGrids supports this recommendation. General MicroGrids would encourage the undertaking of pilots that apply proven technologies in new and "unproven" ways, including addressing how different technologies interact with one another, the synergies that could be harnessed from interoperating and optimizing multiple supply, demand and storage technologies/assets, as for example, through the integrated control of microgrids employing microgrid controllers.

E. Grid 2.0/DC CUB/ Sierra Club support this recommendation and note that the inclusion of EE in pilots from our perspective permits a fully integrated strategy for demand-side management in conjunction with DER and DERMS/ADMS that will not exclude EE from the proposal.

F. OPC supports this recommendation. OPC also feels it is appropriate to allow EE projects so long as they were coordinated with DOEE/DCSEU or other DCPSC directed EE initiatives and are not duplicative in nature. OPC also notes that utility "affiliates and subsidiaries" should not lead projects.

G. Pepco supports the recommendation.

H. Sunrun supports this recommendation.

I. WGL Energy does not support this recommendation. There is no reason why an unregulated subsidiary of either utility should not be able to lead a pilot project if it is selected as a pilot project. The code of conduct rules exist to allow affiliates to function in the marketplace and provide competitive services to the utilities and to other market entrants. WGL Energy supports all other aspects of this Recommendation.

5.6.2 RECOMMENDATION – DCPSC SHOULD IMPLEMENT A PILOT PROJECT SELECTION PROCESS WITH TWO STEP SCREENING

5.6.2.1 Recommendation

The Pilot Projects working group recommends the MEDSIS Pilot phase be initiated by the DCPSC order expected within 60 days of the submittal of the MEDSIS Working Group report. WG6 recommends the order adopt the Pilot Project Selection Strawman process developed by the working group stakeholders. Specifically:

1. Pilot Project ideas/ concepts should proceed through the two step screening process as laid out in Figures 5.15 and 5.17. This process should consist of a two-step procurement process that includes a general call for papers followed by an RFP targeted to specific respondents.
    a. Responses to the call for papers should be evaluated against the MEDSIS principles and technology readiness level of any technologies proposed. The Level 1 Screening portion of the Pilot Project Screening and Scoring Template (see Appendix A.8) has been developed by the working group to serve as a model for is recommended for conducting this evaluation.
    b. Responses would need to receive a minimum score of 80 out of 100 points on the Level 1 Screening to proceed to the RFP stage.
    c. Proposals submitted in response to the RFP should be evaluated via the Level 2 Screening and then ranked using the RFP Scoring Sheet from the Pilot Project Screening and Scoring Template (see Appendix A.8). The working group developed a sample Level 2 and Scoring Sheet, provided as Appendix A.8, as a model for this evaluation.
2. The Pilot Project Phase should be conducted over a timeline consistent with the Pilot Project Timeline developed by the working group and shown in Figure 5.16. The DCPSC should strive to initiative the Pilot Projects phase as soon as practical after issuance of its order with the goal of all pilot projects being selected by end of Q2 2020 and all projects beginning implementation no later than end of 2020. Further, WG6 recommends all pilot projects are executed for one year minimum duration and all conclude in 2022.

5.6.2.2 Background

Throughout the course of the Pilot Project working group's meetings, the discussion of pilot projects was consistently broken down between project selection, project monitoring and reporting, and project evaluation after completion of the project. The various elements of the selection process formed by DCPSC Staff's previous suggestions in the MEDSIS Staff Report was discussed at length. These discussions included conversations around timing and duration of the pilot project phases and both process, governance, and criteria used for selecting pilot projects.

As mentioned in Section 5.6.1.1, the stakeholders used a "gap assessment" approach to evaluating pilot project topics leveraging the initial recommendations put forth by DCPSC Staff in the MEDSIS Staff Report. The following was documented from the gap assessment process:

1. Consensus – process should include an initial funding stage where applicants apply and then are filtered out
2. Gap – timing guidance should be provided for evaluation of the proposals
3. Gap - phases should be given time ranges and criteria developed for moving between phases
4. Consensus – there should be one RFQ process that exhausts all the funding rather than a multi-RFQ process

Conclusions documented from these discussions included the concept of an initial funding stage where applicants apply and then are filtered out. Additionally, there should be one request for proposal (RFP) process that exhausts all available funding rather having multiple rounds of RFQs.

Efficiency of the pilot project selection process was a concern as there was a general desire to initiate pilot projects as soon as possible. While the working group agreed there needed to be rigor in the selection process there was a desire to create a process that was as streamlined as possible. Working group members felt that significant time could be wasted if too wide a net was cast in the RFP process. Similarly, there was acknowledgement that other MEDSIS working groups may be contemplating pilot project concepts to propose to the DCPSC which could be used to inform the pilot projects procurement process.

To capture and document the working groups thinking on this, several pilot project strawmen were created by the MEDSIS Consultants as follows:

1. Pilot Project Selection Process defining the overall selection process flow as shown in Figure 5.16.

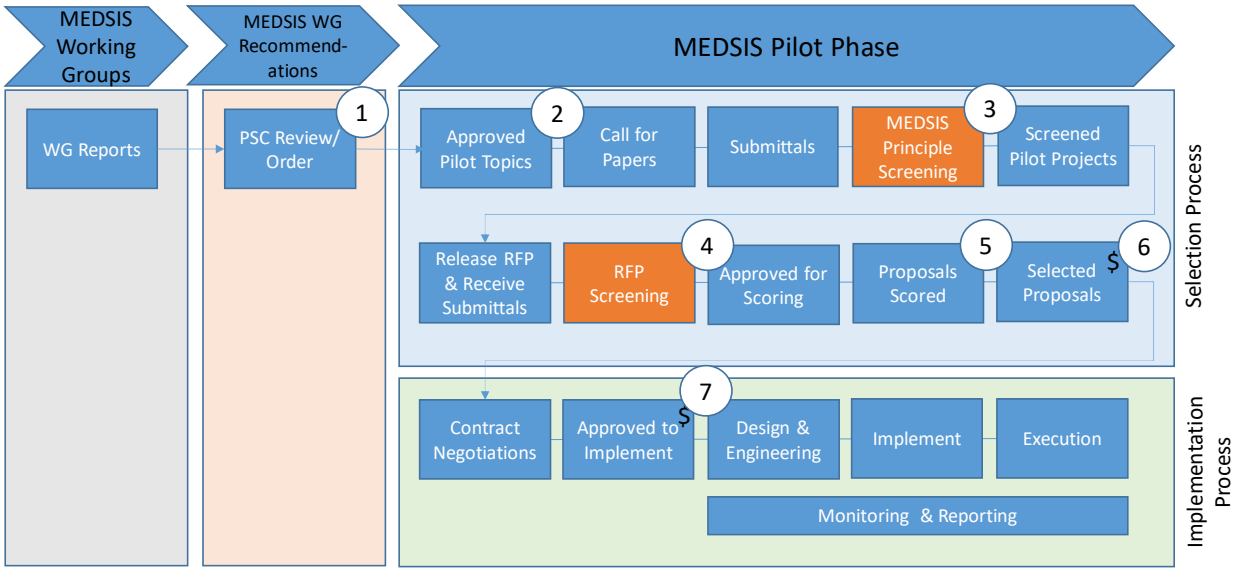

Figure 5. 16 - MEDSIS Pilot Evaluation Strawman

Credit: WG6: Pilot Projects February and March 2019 Meetings

2. Pilot Project Screening and Scoring Template for use in actually conducting the screening steps and scoring proposals (included as Appendix A.9.)
3. Pilot Project Phase Timeline highlighting the likely timing of the pilot project phases

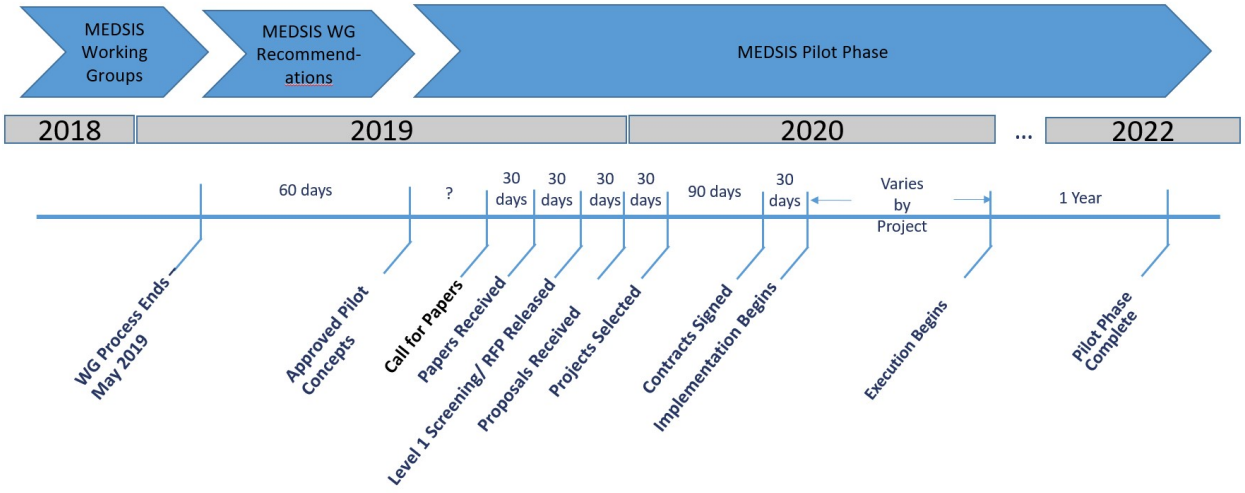

Figure 5. 17 - MEDISS Pilot Project Phase Timeline

Credit: WG6: Pilot Projects March Meetings

4. Pilot Project Governance Model (see Recommendation 5.6.4) addressing the organizational structure to be used for pilot projects selection, monitoring and reporting, and evaluation.

These strawmen were reviewed by the working group in the February and March working group meetings where stakeholders offered suggestions for revisions which have been incorporated into the figures above.

The Pilot Project Selection strawman consisted of the process flow shown above in Figure 5.16 and an accompanying Pilot Project Screening and Scoring template, provided in Appendix A.8. This process flow applies to pilot projects applying for MEDSIS funding. Other demonstration projects, such as those Pepco may wish to pursue at its own discretion, would occur outside of this process.

The process contemplates that pilot project ideas and pilot concepts resulting from the MEDSIS Working Group phase would be evaluated and approved by the DCPSC as part of the Working Group Recommendation Phase. The DCPSC could also recommend additional pilot ideas/ concepts not specified by the working group. From there the strawman process takes effect as shown below in Figure 5.18:

1	Commission reviews MEDSIS WG reports including any recommendations on Pilot concept and other areas ripe for pilot projects in the District. Issues order that includes approved pilot project concepts
2	Call for papers based on order issued in step 1. Call requests specific pilot project concepts with rough timeline and budget information but not all the detail of a full proposal
3	Level 1 Screening: Concept submittals are screened against MEDSIS principles and TRL score using scoring sheet developed by WG6. Concepts that pass screening are eligible for RFP steps
4	RFP developed requesting detailed proposals for concepts that passed Level 1 screening. Applicants required to submit details on Technical Merit & Need, Technical Approach, Environmental Impacts, Qualifications & Experience, and Budget & Risk Management
5	Level 2 Screening: Proposals evaluated against specified criteria using proposal scoring sheet that incorporates Staff's Grant Funding Parameters and input from WG6. Funding released as determined by DCPSC. Selected projects go through Implementation Process
6	Projects receiving the highest scores from the RFP process are eligible for MEDSIS funding. Respondents may not be allocated their full request of funds. Once contracts are finalized, a final set of pilot projects is established and begin implementation
7	Pilot projects are executed for the duration specified in applicants proposal as accepted or amended by DCPSC. Funding released as determined by DCPSC in accordance with contract milestones for the Design &Engineering, Implementation, and Execution steps

Figure 5. 18 - Pilot Project Evaluation Strawman Process Steps

Credit: WG6: Pilot Projects February 2019 Meeting

In March 2019 the WG6 stakeholders also discussed the pilot project phases and timelines. A Pilot Project Phase Timeline strawman was provided and discussed with stakeholders providing comments. The revised timeline strawman is shown in Figure 5.17 above. The overall timeline assumes the pilot projects procurement process begins in 2019 and that pilot projects are selected and implemented in 2020. Pilot projects would then be executed for a minimum 1 year duration and conclude in 2022. Two components of the timeline cannot be specified at this time: the duration between the issuance of the DCPSC's order on the working group report and the initiation of the call for papers (indicated with a "?" in Figure 5.17); and the project implementation timeline occurring after pilot projects are selected. All other timelines in the strawman were deemed reasonable by the stakeholders and consistent with industry practice.

5.6.2.3 Stakeholder Positions

A. DCCA conditionally supports the recommendation. First and foremost, the Pilots should lead to important learning that is not already known, and that advances the MEDSIS principles and the District's Clean Energy DC goals. A project proposal should not get to Level 2 screening if it does not have an adequate statement of learning that can be evaluated at the end of the project.

B. DCSEU supports this recommendation.

C. DCSUN abstains from stating a position.

D. DOEE supports this recommendation and believes it is Important that the pilot selection process gives fair consideration to all proposals, whether they originated from MEDSIS workgroups or outside those groups.

E. EEI supports this recommendation.

F. General MicroGrids conditionally supports this recommendation. While General MicroGrids supports what has been set out and described, General MicroGrids believes that another stage is needed before such stages, given the "regulatory" context for these pilot undertakings. General MicroGrids believes that because the DCPSC (which is not a research and development agency) would be approving these pilots, an additional stage is needed to assure that "priorities" are evaluated and agreed upon by the DCPSC with the help of experts through the governance model and input from stakeholders through a workshop or other means, along the lines of the "California CEC Model" that Mike Gravely discussed for the Working Group. This preliminary stage would assure that pilots undertaken would not be duplicative of other research/pilot efforts ongoing and that RFPs would be designed to address areas of most interest to the Regulator for purposes of considering the development of regulatory protections, reforms and even legislative changes. As set out, while areas would be generally set out in the RFPs, projects selected might depend more on the interests of those responding. Evaluating in the first instance, priorities for the Regulator would help in the design and development of RFPs/RFP that could better assure responses and proposals that will inform the DCPSC's regulatory decision-making and maximize outcomes and lessons learned from the pilot proposals chosen.

G. Grid2.0/DCCUB/Sierra Club conditionally supports this recommendation, however, opposes the deletion of fast-tracking project proposals from the working groups, though at this juncture the clock has run out on the SEPA mediated stakeholder process to facilitate this outcome. We recommend that the PSC evaluate recommendations from the NWA, Rates, and Microgrid working groups in considering whether a fast-tracked Pilot RFP may be expeditiously executed to immediately begin evaluation of integration of DER management systems in conjunction with Pepco's ADMS. Otherwise the process as outlines is rational and well considered.

H. GRID Alternatives Mid Atlantic/ NCS reiterate its comments as incorporated in the final paragraph of the background of 5.4.5.2 regarding equity and inclusion.

I. OPC supports this recommendation.

J. Pepco supports this recommendation.

K. Sunrun supports this recommendation.

L. WGL Energy does not support the imposition of a timeline of 60 days in Recommendation 5.6.1.1 (3) for the DCPSC to adopt the pilot project approach especially if it excludes utility affiliates from leading a project under Recommendation 5.6.1.1. In order to meet legal standards for administrative decisions, the DCPSC must articulate in any order a legally supportable rationale for excluding any entity from bidding on a project in any capacity. Since as WGL Energy asserts in its opposition to Recommendation 5.6.1.1 (3), there is no reasonable rationale for excluding an affiliate of a utility from participating as lead of a pilot project, the DCPSC should be given sufficient time to deliberate on this issue to avoid challenges. DCPSC may wish to consider that both Exelon and Altagas as affiliates of Pepco and Washington Gas, respectively, have made commitments to the DCPSC in existing proceedings that might be partially met through these pilots thereby lowering the costs of the pilots.

5.6.3 RECOMMENDATION – DCPSC TO ADOPT GRANT FUNDING QUALIFICATION PARAMETERS FOR PILOT PROJECTS

5.6.3.1 Recommendation

WG6 recommends the grant funding parameters discussed by DCPSC Staff in the Staff Report are appropriate and should be incorporated into the pilot project selection process. The Pilot Project Screening and Scoring strawman, see Appendix A.8, incorporates these grant funding parameters in the Level 1, Level 2, and RFP Scoring templates used for pilot project selection and should be used a model scoring template for pilot selection moving forward. The following recommendations were also made consistent with the working group's gap assessment findings:

1. Environmental impacts - costs and benefits - should be addressed by pilot project applicants rather than just benefits as stipulated in the DCPSC Staff Report. The requirement to address Environmental Impacts has been captured in the Environmental Impacts section of the RFP Scoring Sheet template in Appendix A.8.
2. A ceiling or cap on funding per pilot project should not be established but the DCPSC in the call for papers and RFP should indicate the number of pilot projects that are anticipated to be funded. WG6 stakeholders concluded 6 – 10 pilot projects as the recommended amount which is consistent with Staff's suggestion specified in the MEDSIS Staff Report.
3. Pilot project applicants should be required to address the scalability and replicability of their pilot projects to ensure projects are selected that, if

successful, would result in the most benefit to the District. The requirement to address scalability and replicability has been captured in the Technical Merit and Need section of the RFP Scoring Sheet template in Appendix A.8.

5.6.3.2 Background

In November 2018, the Pilot Projects working group was briefed by John Howley of DCPSC Staff on the proposed MEDSIS grant funding parameters and proposed demonstration projects content from the MEDSIS Staff Report. The working group then engaged in a discussion into each topic within John's presentation and conducted a "gap assessment" where the group documented areas of consensus and "gaps" or areas requiring more discussion. The group reviewed each of the following grant funding parameters in detail:

- Type and Purpose of Pilot Projects
- Reputation & Track Record of Applicants
- Project Funding Plan
- Environmental Benefits
- Interconnection Considerations
- PJM Interconnection
- Commission Oversight
- Public Interest Determination
- Risk Management
- Enabling Contracts
- Economic and Fiscal Impacts
- Impacts on the Obligation to Serve & Public Safety Responsibilities

Based on the working group's discussion during the gap assessment exercise, the following conclusions were recorded by the working group:

1. Consensus – Environmental "impacts" should be address by applicant – costs and benefits - not just benefits
2. Consensus – A ceiling should be established for the funding available to projects
3. Gap – Public Interest Determination should incorporate the MEDSIS Vision. Need to map MEDSIS Principles to these funding parameters to ensure alignment
4. Consensus - Scalability and replicability requirement should be captured within these parameters

It should be noted that after further discussion in subsequent meetings the public interest determination requirement outlined in the Staff report was sufficient thus resolving the gap listed in bullet 3.

WG6 participants discussed the idea of a cap or ceiling for funding of individual pilot projects in detail in the March working group meeting. It was discussed that specifying

a cap purposely constrains applicants which may cause some applicants not to submit concepts or respond to the RFP. The stakeholders decided it would be better to indicate in the call for papers or RFP the number of projects being targeted for MEDSIS funding. In this way applicants could roughly calculate the MEDSIS funding available but would not be constrained to an artificial cap. Likewise, this would give the DCPSC more flexibility in selecting projects as it was recognized some projects, by nature, will be more complicated or are anticipated to provide significant benefits thus justifying application of more MEDSIS funds than another pilot project that is less complicated to implement.

5.6.3.3 Stakeholder Positions

A. DCCA conditionally supports this recommendation. DCCA believes that the Parameters should include a monitoring, reporting and evaluation section built into the project design and included as a distinct budget item. We do not think that this is adequately covered in the Technical Approach section of the RFP Scoring Sheet, Appendix A.8.

B. DCSEU supports this recommendation.

C. DCSUN abstains from stating a position.

D. DOEE supports this recommendation.

E. EEI supports this recommendation.

F. General MicroGrids supports this recommendation, but notes that WG6 stakeholders believed that, of necessity, funding would probably cover about 6 to 10 pilot projects. Therefore, the Regulator does need to be “strategic” in selecting pilots to inform the agency’s decision-making; limited resources/budget would support the need to have a preliminary stage (as discussed above) to review and delineate priority areas for pilot development, with a view to better designing the RFP/RFPs to elicit responses and proposals that can address matters of priority concern to the Regulator and to be carried out in a manner to maximize outcomes and lessons learned.

G. Grid2.0/DCCUB/Sierra Club support this recommendation.

H. GRID Alternatives MidAtlantic/NCS reiterates its comments as incorporated in the final paragraph of the background of 5.4.5.2 regarding equity and inclusion

I. OPC supports this recommendation.

J. Pepco supports this recommendation.

K. Sunrun supports this recommendation.

L. WGL Energy supports this recommendation with the exception that it maintains its objection to exclusion of utility affiliates under Recommendation 5.6.1.1 (3).

5.6.4 RECOMMENDATION – DCPSC TO IMPLEMENT A PILOT PROJECTS GOVERNANCE MODEL

5.6.4.1 Recommendation

WG6 recommends the DCPSC implement the governance model referenced in Figure 5.19 in Section 5.6.4.2. This structure should be set up in time to support the Pilot Projects Phase and provide its advisory function throughout the pilot project selection, monitoring and reporting, and evaluation steps.

WG6 recommends the following specific attributes be established for the Advisory Group established under this model.

1. Advisory Board Responsibilities
    a. Make recommendations to the PSC Staff on the Pilot Projects that qualify for MEDSIS funding
    b. Provide oversight of Projects once implemented
2. Roles & Requirements for Board Members
    a. Contribute to and adhere to Charter
    b. Attend quarterly meetings – miss no more than 1 per year
    c. Offer advisory services only
3. Participants
    a. Not to exceed 13 board members – all volunteer positions
    b. Include at a minimum DOEE, OPC, PSC Staff, DOEE/DCSEU, and DCCUB subject to subsection g below
    c. Other interested consumer, environmental, and/ or community/ civic groups upon their request to participate
    d. A minimum of 1 and up to 4 remaining positions filled by outside industry representatives, who participate on a volunteer basis, as approved by DCPSC
    e. A Board Chairperson as selected by vote from all members
    f. Will be supported by DCPSC staff and DCPSC Consultant Staff that will drive all Board activities
    g. Organizations planning to submit Pilot Project proposals or who may receive MEDSIS funds directly or as a named sub-contractor are precluded from serving on the board. Additionally, a utility that seeks to partner in a proposal to recover through rates any portion of the project costs or any distribution system impacts associated with the project should be precluded from serving on the board
    h. District utilities shall participate as consultants to the Advisory Group. The Advisory Group should communicate with the applicable utility on the potential impact of proposed pilot projects on the system or ongoing system planning efforts.

5.6.4.2 Background

Early in the WG6 discussions, it was recognized that the governance model used for oversight of the pilot project selection, monitoring and reporting, and evaluation processes was an important topic for working group discussion. In fact, this was captured in the charter for the working group as both a key question to address and a desired outcome.

In the November and December 2018 WG6 meetings, the subject of governance was revisited as part of the ongoing "gap assessment" conducted by the working group of the DCPSC Staff's recommendations in the MEDSIS Staff Report. In November 2018, John Howley of DCPSC Staff presented a summary of the Staff's thoughts around the pilot project selection options with option 1 being an independent board and option 2 being the DCPSC Staff as supported through a consultant. In December 2018, the stakeholders heard a presentation from the California Energy Commission (CEC) on their EPIC funding process. The speaker indicated the CEC does all project governance using in house resources. The stakeholders also discussed the NY Revconnect[50] process which leverages a consultant for initial screening of pilot projects ideas before they are presented to the utilities. Applicants in NY are also given an opportunity to receive feedback on their proposals and modify them accordingly. It was noted that NY and CA both have large, well-funded energy departments to leverage for this selection work.

The CEC presenter mentioned he sometimes reviews of pilot proposals in NY which initiated a group discussion on if the selection committee envisioned for MEDSIS could be an all-volunteer board thus freeing up MEDSIS funds for actual projects. Finally, it was recognized that, due to the technical nature of the pilot projects, any organization created will need to have some technical expertise to both influence the pilot RFP process and to evaluate responses.

This discussion concluded with the points below being logged in the Gap Assessment:

1. Consensus – Independent board leveraging industry stakeholders is desired for pilot selection process. Group would be referred to as third-party advisor
2. Consensus – Board would advise DCPSC but would not decide on actual pilot projects
3. Consensus – DC PSC has final approval authority on pilots selected
4. Gap – Makeup of the board (NYSERDA, CEC, DOEE, OPC, Non-profits, IREC, RAP, etc.) and actual governance structure

[50] https://nyrevconnect.com/

In an attempt to address the open gap in bullet 4 above, a governance strawman, shown in Figure 5.19, was created by the MEDSIS facilitator and reviewed with the working group in March. The model includes an independent Advisory Board that provides advice to the DCPSC Staff regarding the selection, monitoring and reporting, and evaluation phases of pilot projects. The DCPSC Staff and DCPSC Consultants initiate all call for papers, screening of submittals, development of RFP(s), and scoring of proposals. The DCPSC Staff would make recommendations to the DSPSC Commissioners who make all final decisions around pilot project selections and other matters. Pilot project applicants and awardees would interface with the DCPSC Staff and/or DCPSC Consultants for all day to day aspects of the pilot projects during implementation and execution of the projects.

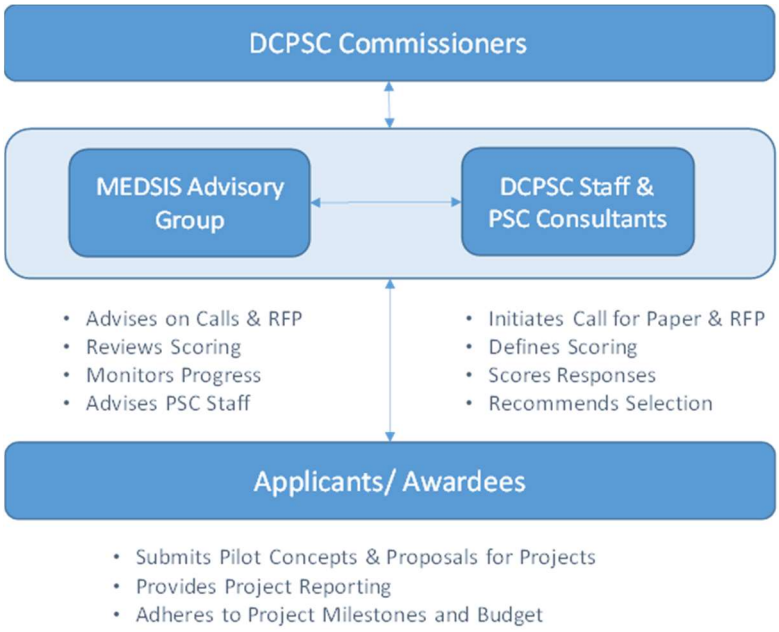

Figure 5. 19 - Pilot Project Governance Structure Model

5.6.4.3 Stakeholder Positions

A. AOBA offers no position on the recommendation but offers that all proposed pilot projects be subject to a cost and benefit assessment before approval by the Commission. Any approved pilot must be limited in scope and duration and not continued if it fails within reasonable time to meet performance metrics adopted during the cost and benefit vetting process.

B. DCCA conditionally supports. Item "2: DCCA believes that conflict of interest provisions should be included under Roles & Requirements for Board Members.

   a. Item 3: DCCA believes that the "public interest" should not be overwhelmed by industry on this board and thus, public interest representatives should at least equal the number of industry related representatives (including utility related).

   b. Sub-item "h": presents a potential conflict of interest where the utility has a stake in a project under consideration

C. DCSEU supports this recommendation.

D. DCSUN abstains from stating a position.

E. DOEE conditionally supports this recommendation.

F. EEI supports the recommendation.

G. OPC supports this recommendation.

H. General MicroGrids conditionally supports this Recommendation. General MicroGrids recommends placing great weight on the expertise, knowledge and experience qualifications of parties considered for the Advisory Board and not just on the stakeholder interests that they would represent. The section on "Participants" does not address such qualifications and should include the development of such criteria by the DCPSC and its staff related to the assistance to be provided to the agency.

I. Grid2.0/DCCUB/ Sierra Club support this recommendation.

J. GRID Alternatives MidAtlantic/NCS suggests that it would be beneficial to include MDV-SEIA (the Maryland-DC-Delaware-Virginia Solar Energy Industries Association) among the participants listed in section b.

K. Pepco supports this recommendation.

L. Sunrun supports this recommendation.

M. WGL Energy supports this recommendation and respectfully requests that the organization MDV-SEIA be added as an advisory board member, since the pilots are dealing with distributed energy resources and at present the Governing Board as designed does not include any representative organizations from third party developers

6 Next Steps

To aid the Commission's evaluation of the recommendations in Chapter 5, the MEDSIS working groups jointly discussed the potential timing for executing each recommendation. This process included a discussion on how aligned each recommendation was with the MEDSIS principles. Input was based on stakeholder input using the Mentimeter [51]polling application which stakeholders accessed via their smartphone or computer during the April meeting.

Stakeholders who participated[52] in this exercise included:

1. Pepco
2. General MicroGrids
3. EEI
4. GRID2.0
5. New Columbia Solar
6. DOEE
7. Energy Forward
8. Tracy Warren
9. Sunrun
10. Solar United Neighbors of DC
11. WGL Energy
12. OPC
13. DCCA
14. VEIC/DCSEU
15. Consumer Utility Board
16. US GSA
17. PJM (only answered the timing questions for WG2, WG3 and WG4)

Input from these stakeholders and the MEDSIS Consultant summary analysis has been compiled in the sections that follow.

6.1 Recommendation Timing

6.1.1 PROCESS

Many factors can influence the timing for implementing the recommendations from Chapter 5 not the least of which is approval by the DCPSC to initiate the recommendation. Still, the working groups wanted to provide the Commission with input on the relative timing for implementing each recommendation. Thus, in the April

[51] https://www.mentimeter.com/

[52] Not all stakeholders participated in all exercises or answered all questions within each exercise.

joint working group meeting, an exercise was conducted to solicit stakeholder input on recommendation timing. The following parameters were used to conduct the exercise:

1. Learnings were excluded from the exercise
2. Timing input for each recommendation was based on the question, "How long would it take to implement the recommendation in the field?" Note, the wording is important. The question asked how long "would" it take and thus focused on timing regardless of stakeholder bias for or against the recommendation. The question also includes "to implement in the field." Importantly, this means the stakeholders evaluated each recommendation for timing to be fully implemented – not just initiated.
3. Stakeholders were told to assume implementation would not start until after the Commission issues it's order on the working group report
4. Recommendations were classified as short term (ST), mid term (MT), or long term (LT)
    a. ST – can be implemented in 6 – 12 months
    b. MT – can be implemented in 12 months to 2 years
    c. LT – can be implemented in 2 to 5 years
5. With these ground rules in place, stakeholders were then asked to provide their input for each recommendation

After the exercise, the MEDSIS Consultants compiled the results from the Mentimeter data. Based on the results, certain recommendations were clearly identified as ST, MT or LT. However, in some instances the results were less clear or stakeholder input was mixed requiring the MEDSIS Consultant to exercise their best judgement to provide a timing designation for the recommendation.

The MEDSIS Consultants also revisited the learnings excluded from the working group exercise. While learnings were not initially scored by stakeholders during the joint working group meeting, some learnings do have timing implications should the DCPSC act on them. Therefore, for completeness, the MEDSIS Consultant assigned timing designations to the learnings to give the Commission's a comprehensive view of the timing for all learnings and recommendations. This analysis also revealed that some recommendations and learnings are instrumental for other recommendations to be implemented or are needed to facilitate the next phase of MEDSIS. Examples included definitions, pilot project ideas, pilot project processes and specific DCPSC direct orders. For these recommendations/ learnings, a new timing classification of Foundational was created. When the MEDSIS consultants reviewed each recommendation, we found that there was bifurcation on a few of the recommendations. For example, a significant number of people might have rated something as LT and equally material number rated the same recommendation at MT. As a result, two new classifications were added, (ST to MT and MT to LT) which reflect broader ranges as a result of the diverse opinions.

Thus, the MEDSIS Consultant's analysis resulted in additional timing classifications as follows:

a. F - should be implemented in 3 - 6 months
b. ST – can be implemented in 6 – 12 months
c. ST to MT – can be implemented in 6 months to 2 years

d. MT – can be implemented in 12 months to 2 years
e. MT to LT – can be implemented in 12 months to 5 years
f. LT - can be implemented in 2 to 5 years

Appendix A.10 provides a complete listing of the timing results for all recommendations/ learnings.

6.1.2 TIMING RESULTS

WG1: Data Information Access and Alignment

The joint working group reviewed the WG1 – DIAA recommendations and developed the timing input shown in Table 6.1 below. Based on the working group input, several of the recommendations can be implemented in the short term timeframe. Certain recommendations – such as 5.1.6 and 5.1.7 – involve website updates regarding information that is already available and can be executed in the short term. Other recommendations – such as 5.1.8 – may take longer to implement and were given the MT designation. For detailed timing results see Appendix A.10.

DIAA Working Group Recommendations	Timing
5.1.1 DCPSC to Explore Metric for Evaluating Carbon Footprint Impact of DER Projects	ST to MT
5.1.2 DCPSC to Develop Benefit Cost Analysis (BCA) Methodology	MT
5.1.3 DCPSC to Align MEDSIS with Clean Energy DC Act	ST to MT
5.1.4 DCPSC to Continue to Improve Small Generator Interconnection Process	ST
5.1.5 DCPSC to Revise Language in MEDSIS Vision Statement	ST
5.1.6 DCPSC to Develop Publicly Available System-Level Data Web-page	ST
5.1.7 DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis	ST
5.1.8 DCPSC to Direct Pepco to Create a secure web portal for RFP Responses and Programmatic Data Requests	MT
5.1.9 Apply MEDSIS Guiding Principle Metrics for General DCPSC Decision Making	ST

Table 6. 1 – DIAA Working Group Recommendation Timing

WG2: Non-wire Alternatives

The joint working group reviewed the WG2 – NWA recommendations and developed the timing input shown in Table 6.2 below. Learning 5.2.5 should be regarded as a Foundational item for the Commission as it relates to a Commission direct order to

explore rules around ownership of DERs. Recommendation 5.2.4 outlines the recommended definition of advanced inverter as requested by the Commission and should be regarded as a Foundational recommendation. Learning 5.2.6 should also be regarded as a Foundational learning for the Commission as it relates to the Pilot Projects phase of the MEDSIS Initiative. Recommendation 5.2.1 involves the establishment of a NWA definition and should be regarded as a Foundational recommendation. Based on the working group input, the remaining recommendations in the NWA Working Group are split between ST and MT. Recommendation 5.2.2 involves establishing a NWA classification which the working group has already developed, therefor is given a ST designation. The MT recommendations – such as 5.2.3 and 5.2.7 – involve process changes to the existing distribution system planning process and an establishment of a stakeholder working.

NWA Working Group Recommendations	Timing
5.2.1 DCPSC to Establish a NWA Definition	F
5.2.2 DCPSC to Establish NWA Classifications	ST
5.2.3 DCPSC Should Order a Stakeholder-Informed DSP and NWA Consideration Process	MT
5.2.4 DCPSC to Establish an Advanced Inverter Definition	F
5.2.5 Learning: Stakeholder Input on DCPSC Rules Around Ownership of DERs	F
5.2.6 Learning: Need for Demonstrating NWA Projects in the District	F
5.2.7 DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders	MT

Table 6. 2 – NWA Working Group Recommendation Timing

WG3 - Rate Design

The joint working group reviewed the WG3 – Rate Design recommendations and developed the timing input shown in Table 6.3 below. Recommendation 5.3.1 involves the reconvening of a working group and development of a dynamic pricing program and was given a fairly even split of ST and MT designations by several stakeholders. Recommendation 5.3.2 involves the procurement and completion of a value of DER and value of grid study and was given the MT and LT designation by several stakeholders.

Rate Design Working Group Recommendations	Timing
5.3.1 DCPSC to Reconvene Dynamic Pricing Working Group	ST to MT
5.3.2 DCPSC to Initiate a Value of DER and Value of Grid Study	MT to LT

Table 6. 3 – Rate Design Working Group Recommendation Timing

WG4: Customer Impact

The joint working group reviewed the WG4 – Customer Impact recommendations and developed the timing input shown in Table 6.4 below. The ST recommendations – such as 5.4.1, 5.4.2 and 5.4.5 – involve the DCPSC consolidating educational material including information on low income programs and competitive energy supply offers and hosting this information on a public website. Recommendation 5.4.4 involves a more time intensive activity of developing energy efficiency programs for master metered apartments however, progress that is being made in the working group associated with FC1148[53] may enable Recommendation 5.4.4 to be implemented more quickly. Because of this, the timing for this recommendation was changed to ST to MT. Because Recommendation 5.4.6 involves revising the CBOR (or establishing provisional rules) to support the MEDSIS Pilot Projects Phase, it was regarded as Foundational. Recommendation 5.4.8 was bifurcated from Recommendation 5.4.3 during the April joint working group meetings and therefore, stakeholders did not provide timing input for it. The MEDSIS Consultants assigned it a timing of MT.

Customer Impact Working Group Recommendations	**Timing**
5.4.1 DCPSC to Enhance and Consolidate Customer Education Materials	ST
5.4.2 DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers	ST
5.4.3 DCPSC to Work with Pepco to Enhance Customer Data Access and Protection	ST to MT
5.4.4 DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments	ST to MT
5.4.5 DCPSC to Support Customer Participation in Low-Income Programs	ST
5.4.6 DCPSC to Revise CBOR Support the MEDSIS Pilots Projects Phase	F
5.4.8 DCPSC to Ensure Connection Between Customer Energy Usage and Their Environmental Impact	MT

Table 6. 4 – Customer Impact Working Group Recommendation Timing

[53] Formal Case No. 1148, In The Matter Of The Investigation Into The Establishment And Implementation Of Energy Efficiency And Energy Conservation Programs Targeted Towards Both Affordable Multifamily Units And Master Metered Multifamily Buildings Which Include Low And Limited Income Residents In The District Of Columbia

WG5: Microgrids

The joint working group reviewed the WG5 – Microgrids recommendations and developed the timing input shown in Table 6.5 below. Learning 5.5.6 was classified as Foundational for the Commission as it relates to the definition of resilience, which the working group acknowledges as an important task to appropriately address the value of resilience. Learning 5.5.10 was also designed Foundational for the Commission as it relates to the Pilot Project phase of the MEDSIS Initiative and discusses the opportunity to demonstrate and test several of the regulatory and business model constructs that are put forth as recommendations to the Commission. The remainder of the recommendations in the Microgrids Working Group were regarded by the stakeholders as more MT to LT recommendations based on the results.

Microgrids Working Group Recommendations	**Timing**
5.5.3 DCPSC to Establish New Regulated Entity of "Microgrid Operator"	MT to LT
5.5.4 DCPSC to Direct the Utility to Establish a Customer Microgrid Schedule	MT to LT
5.5.5 DCPSC to Determine How Utilities Recover Costs of Microgrid Assets	MT
5.5.6 Learning: Opportunity to Define Resilience at the Distribution Level	F
5.5.7 DCPSC to Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids and Storage	MT
5.5.8 DCPSC/DC Council to Modify Methodology for Calculating DCPSC and DC Law Surcharges of District Customers' Bills	MT to LT
5.5.10 Learning: Opportunity to Leverage MEDSIS Funds to Pilot Multi-Customer Microgrids in the District	F

Table 6. 5 – Microgrids Working Group Recommendation Timing

WG6: Pilot Projects

The joint working group reviewed the WG6 – Pilot Project recommendations and developed the timing input shown in Table 6.6 below. Recommendations 5.6.1 through 5.6.4 were all classified as Foundational for the Commission as they relate to the Pilot Project phase of the MEDSIS Initiative.

Pilot Projects Working Group Recommendations	Timing
5.6.1 DCPSC to Adopt Pilot Exclusions	F
5.6.2 DCPSC to Adopt Pilot Project Selection Process with Two Step Screening	F
5.6.3 DCPSC to Adopt Grant Funding Qualification Parameters	F
5.6.4 DCPSC to Adopt the Pilot Projects Governance Model	F

Table 6. 6 – Pilot Projects Working Group Recommendation Timing

6.2 Recommendation Alignment with MEDSIS Vision

6.2.1 PROCESS

By definition, all recommendations developed from the MEDSIS working group process should be consistent with the MEDSIS Vision. Still, some are naturally more aligned to certain MEDSIS principles and, in some cases, may even conflict with other principles. To develop a deeper understanding of this, the working group engaged in an exercise to provide stakeholder input on how aligned each recommendation was with the MEDSIS principles. It was the goal of the working group to use this information to inform the Commission on the impact each recommendation may have in moving the District closer to the MEDSIS vision. The following parameters were used to conduct the exercise:

1. Alignment input was based on the question, “If the recommendation were in place/ implemented, how well does it align with the MEDSIS principles?”
2. Learnings were excluded from the exercise
3. Administrative and process oriented recommendations were excluded from the exercise. Excluded recommendations included:
    a. 5.1.5 DCPSC to Revise Language in MEDSIS Vision Statement
    b. 5.1.9 Apply MEDSIS Guiding Principle Metrics for General DCPSC Decision Making
    c. 5.2.1 DCPSC to Establish a NWA Definition
    d. 5.2.2 DCPSC to Establish NWA Classifications
    e. 5.2.4 DCPSC to Establish an Advanced Inverter Definition
    f. 5.6.1 DCPSC to Adopt Pilot Exclusions
    g. 5.6.2 DCPSC to Adopt Pilot Project Selection Process with Two Step Screening

   h. 5.6.3 DCPSC to Adopt Grant Funding Qualification Parameters
   i. 5.6.4 DCPSC to Adopt the Pilot Projects Governance Model
4. Stakeholders used the scale below to align the recommendation to each of the 7 MEDSIS principles
   a. 0 points – Negative impact on the principle
   b. 1 point – No impact on the principle
   c. 2 points – Weak positive impact on the principle
   d. 3 points – Strong positive impact on the principle

6.2.2 ALIGNMENT RESULTS

Using the process above, 23 of the total 32 recommendations were evaluated against the MEDSIS principles. For each recommendation, an average score was calculated for each principle as well as a total average for the recommendation across all principles. The highest possible average score a recommendation could have received was 21 and the lowest possible score was 0. Because the alignment scale only ranged from 0 – 3 there was not a wide distribution of scores across recommendations. Still, the results do reveal those recommendations the stakeholders felt would have the highest impact on each principle and on the overall MEDSIS vision. Appendix A.11 provides a summary of all the data collected and is sorted by working group and by each recommendation within that working group.

Table 6.7 below provides a listing of the recommendations in order by their total average score across all principles. Refer to the Table Key for cell shading.

Recommendation	Sustainable	Well-Planned	Safe & Reliable	Secure	Affordable	Interactive	Non-Discriminatory	Avg. Principle Score	Total Avg. Score
5.2.7 DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders	2.50	**2.57**	**2.36**	**2.07**	1.14	2.14	1.86	**2.09**	**14.64**
5.1.4 DCPSC to Continue to Improve Small Generator Interconnection Process	2.44	2.25	2.06	1.63	1.63	2.38	2.00	**2.05**	**14.38**
5.3.1 DCPSC to Reconvene Dynamic Pricing Working Group	2.50	2.10	1.50	1.10	2.20	2.40	2.40	**2.03**	**14.20**
5.5.7 DCPSC to Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids and Storage	2.38	2.38	2.31	1.92	1.31	2.00	1.85	**2.02**	**14.15**
5.4.5 DCPSC to Support Customer Participation in Low-Income Programs	1.92	1.92	1.15	1.15	**2.77**	2.46	**2.77**	**2.02**	**14.15**
5.4.4 DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments	2.64	2.00	1.36	1.14	2.50	1.79	2.29	**1.96**	**13.71**
5.1.7 DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis	2.36	2.47	1.64	1.15	1.46	**2.73**	1.86	**1.95**	**13.67**
5.1.8 DCPSC to Direct Pepco to Create a secure web portal for RFP Responses and Programmatic Data Requests	1.93	2.43	1.93	**2.07**	1.21	2.43	1.50	**1.93**	**13.50**
5.4.3 DCPSC to Work with Pepco to Enhance Customer Data Access and Protection	2.20	2.07	1.20	1.73	1.40	2.67	2.20	**1.92**	**13.47**
5.1.6 DCPSC to Develop Publicly Available System-Level Data Webpage	1.87	2.44	1.67	1.14	1.36	2.69	2.20	**1.91**	**13.36**

Recommendation	Sustainable	Well-Planned	Safe & Reliable	Secure	Affordable	Interactive	Non-Discriminatory	Avg. Principle Score	Total Avg. Score
5.2.3 DCPSC Should Order a Stakeholder-Informed DSP and NWA Consideration Process	2.14	2.36	1.36	1.21	1.79	2.36	2.07	**1.90**	**13.29**
5.3.2 DCPSC to Initiate a Value of DER and Value of Grid Study	2.33	2.53	1.87	1.40	1.67	2.00	1.40	**1.89**	**13.20**
5.4.1 DCPSC to Enhance and Consolidate Customer Education Materials	2.00	1.73	1.33	1.13	1.87	2.40	2.53	**1.86**	**13.00**
5.5.3 DCPSC to Establish New Regulated Entity of "Microgrid Operator"	1.86	2.36	2.14	1.71	1.21	1.93	1.64	**1.84**	**12.86**
5.4.8 DCPSC to Ensure Connection Between Customer Energy Usage and Their Environmental Impact	2.62	1.62	1.31	1.00	1.62	2.69	2.00	**1.84**	**12.85**
5.5.4 DCPSC to Direct the Utility to Establish a Customer Microgrid Schedule	1.87	2.47	1.93	1.47	1.29	1.67	1.67	**1.76**	**12.35**
5.1.2 DCPSC to Develop Benefit Cost Analysis (BCA) Methodology	2.67	2.40	1.60	1.00	1.67	1.47	1.47	**1.75**	**12.27**
5.1.3 DCPSC to Align MEDSIS with Clean Energy DC Act	**2.88**	2.00	1.63	1.25	1.25	1.75	1.50	**1.75**	**12.25**
5.4.2 DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers	1.73	1.60	1.13	0.80	1.73	2.53	2.00	**1.65**	**11.53**
5.5.8 DCPSC/DC Council to Modify Methodology for Calculating DCPSC and DC Law Surcharges of District Customers' Bills	1.70	2.00	1.20	1.00	2.18	1.18	1.91	**1.6**	**11.17**

Recommendation	Sustainable	Well-Planned	Safe & Reliable	Secure	Affordable	Interactive	Non-Discriminatory	Avg. Principle Score	Total Avg. Score
5.1.1 DCPSC to Explore Metric for Evaluating Carbon Footprint of DER Projects	2.81	1.75	1.27	1.13	1.00	1.75	1.19	**1.56**	**10.90**
5.4.6 DCPSC to Revise CBOR Support the MEDSIS Pilots Projects Phase	1.23	1.69	1.38	1.00	1.36	2.29	1.92	**1.55**	**10.87**
5.5.5 DCPSC to Determine How Utilities Recover Costs of Microgrid Assets	1.60	1.70	1.20	1.10	1.30	1.10	1.30	**1.33**	**9.30**

Table 6. 7 – MEDSIS Working Group Recommendations Principle Alignment Average Scores

MEDSIS Recommendation Alignment Table Key:
Highest Principle Score
2.50 – 3.00
2.00 – 2.49
1.50 – 1.99
1.00 – 1.49
< 1.00

This data suggests the recommendations with the highest average scores will provide the most impact on achieving the MEDSIS vision and therefore, should be considered for immediate implementation. Section 6.3 of this chapter attempts to combine the timing considerations discussed in Section 6.1 with this alignment data to give the DCPSC an initial plan for sequencing the recommendations - assuming all are to be implemented.

The tables that follow provide an additional breakdown of recommendation alignment to specific MEDSIS principles. For these tables the top 5 recommendations (including ties) have been provided for each principle.

Principle: Sustainable

WG	Recommendation	Principle Score
DIAA	5.1.3 DCPSC to Align MEDSIS with Clean Energy DC Act	2.88
DIAA	5.1.1 DCPSC to Explore Metric for Evaluating Carbon Footprint of DER Projects	2.81
DIAA	5.1.2 DCPSC to Develop Benefit Cost Analysis (BCA) Methodology	2.67
Customer Impact	5.4.4 DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments	2.64
NWA	5.2.7 DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders	2.50
Rate Design	5.3.1 DCPSC to Reconvene Dynamic Pricing Working Group	2.50

Table 6. 8 – Recommendations with Highest Sustainable Principle Score

It should be noted that all recommendations received an average score higher than 1 indicating stakeholders felt all recommendations had at least a weak positive impact on the Sustainable principle. Recommendation 5.4.6, DCPSC to Revise the CBOR to Support the MEDSIS Pilots Projects Phase, received the lowest score of 1.23 with most stakeholders feeling it had no impact on Sustainability.

Principle: Well Planned

WG	Recommendation	Principle Score
NWA	5.2.7 DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders	2.57
Rate Design	5.3.2 DCPSC to Initiate a Value of DER and Value of Grid Study	2.53

WG	Recommendation	Principle Score
Microgrids	5.5.4 DCPSC to Direct the Utility to Establish a Customer Microgrid Schedule	2.47
DIAA	5.1.7 DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis	2.47
DIAA	5.1.6 DCPSC to Develop Publicly Available System-Level Data Webpage	2.44
DIAA	5.1.2 DCPSC to Develop Benefit Cost Analysis (BCA) Methodology	2.40

Table 6. 9 – Recommendations with Highest Well-Planned Principle Score

All recommendations received an average score higher than 1 indicating stakeholders felt all recommendations had at least a weak positive impact on the Well-Planned principle. Recommendation 5.4.2, DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers, received the lowest score of 1.60 with most stakeholders feeling it had either no impact or a weak positive impact on the grid being Well Planned.

Principle: Safe and Reliable

WG	Recommendation	Principle Score
NWA	5.2.7 DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders	2.36
Microgrids	5.5.5 DCPSC to Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids and Storage	2.31
Microgrids	5.5.3 DCPSC to Establish New Regulated Entity of "Microgrid Operator"	2.14
DIAA	5.1.4 DCPSC to Continue to Improve Small Generator Interconnection Process	2.06

WG	Recommendation	Principle Score
DIAA	5.1.8/9 DCPSC to Direct Pepco to Create a secure web portal for RFP Responses and Programmatic Data Requests	1.93
Microgrids	5.5.4 DCPSC to Direct the Utility to Establish a Customer Microgrid Schedule	1.93

Table 6. 10 – Recommendations with Highest Safe and Reliable Principle Score

It should be noted that all recommendations received an average score higher than 1 indicating stakeholders felt all recommendations had at least a weak positive impact on the Safe and Reliable principle. Recommendation 5.4.2, DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers, received the lowest score of 1.13 with almost all stakeholders feeling it had no impact on the grid being Safe and Reliable.

Principle: Secure

WG	Recommendation	Principle Score
DIAA	5.1.8/9 DCPSC to Direct Pepco to Create a secure web portal for RFP Responses and Programmatic Data Requests	2.07
NWA	5.2.7 DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders	2.07
Microgrids	5.5.5 DCPSC to Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids and Storage	1.92
Customer Impact	5.4.3 DCPSC to Work with Pepco to Enhance Customer Data Access and Protection	1.73
Microgrids	5.5.3 CPSC to Establish New Regulated Entity of "Microgrid Operator"	1.71

WG	Recommendation	Principle Score
DIAA	5.1.4 DCPSC to Continue to Improve Small Generator Interconnection Process	1.63

Table 6. 11 – Recommendations with Highest Secure Principle Score

Many of the recommendations received alignment scores indicating no impact on the MEDSIS principle of Secure (e.g., they received a score of 1 or very close to 1). Recommendation 5.4.2, DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers, actually received an alignment score of 0.8 indicating a negative impact on Security. Of the 16 stakeholders scoring, 13 gave this recommendation an alignment score of 1 – no impact and 3 gave it a score of 0 – negative impact. It's unclear if these 3 negative scores were intentional or if they are a scoring anomaly.

Principle: Affordable

WG	Recommendation	Principle Score
Customer Impact	5.4.5 DCPSC to Support Customer Participation in Low-Income Programs	2.77
Customer Impact	5.4.4 DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments	2.50
Rate Design	5.3.1 DCPSC to Reconvene Dynamic Pricing Working Group	2.20
Customer Impact	5.4.1 DCPSC to Enhance and Consolidate Customer Education Materials	2.18
Microgrids	5.5.12 DCPSC/DC Council to Modify Methodology for Calculating DCPSC and DC Law System Benefit Charges of District Customers' Bills	1.87

Table 6. 12 – Recommendations with Highest Affordable Principle Score

It should be noted that all recommendations received an average score higher than 1 indicating stakeholders felt all recommendations had at least a weak positive impact on the Affordable principle. Recommendation 5.1.1, DCPSC to Explore Metric for Evaluating Carbon Footprint of DER Projects, received the lowest score of 1.0 but actually had a wide range of scores from stakeholders that happened to result in an

average score of 1. Recommendation 5.2.7, DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders, received a score of 1.14 indicating a very weak positive impact on the Affordable principle with the majority of stakeholders giving it a score of 1 – no impact.

Principle: Interactive

WG	Recommendation	Principle Score
DIAA	5.1.7 DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis	2.73
DIAA	5.1.6 DCPSC to Develop Publicly Available System-Level Data Webpage	2.69
Customer Impact	5.4.8 DCPSC to Ensure Connection Between Customer Energy Usage and Their Environmental Impact	2.69
Customer Impact	5.4.3 DCPSC to Work with Pepco to Enhance Customer Data Access and Protection	2.67
Customer Impact	5.4.2 DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers	2.53
Customer Impact	5.4.5 DCPSC to Support Customer Participation in Low-Income Programs	2.46

Table 6. 13 – Recommendations with Highest Interactive Principle Score

All recommendations received an average score higher than 1 indicating stakeholders felt all recommendations had at least a weak positive impact on the Interactive principle. In fact, most recommendations had average scores closer to 2.0. Recommendation 5.5.3, DCPSC to Determine How Utilities Recover Costs of Microgrid Assets, received the lowest score of 1.10 with almost all stakeholders feeling it had no impact the grid being Interactive.

Principle: Non-Discriminatory

WG	Recommendation	Principle Score
Customer Impact	5.4.5 DCPSC to Support Customer Participation in Low-Income Programs	2.77
Customer Impact	5.4.1 DCPSC to Enhance and Consolidate Customer Education Materials	2.53
Rate Design	5.3.1 DCPSC to Reconvene Dynamic Pricing Working Group	2.40
Customer Impact	5.4.4 DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments	2.29
DIAA	5.1.6 DCPSC to Develop Publicly Available System-Level Data Webpage	2.20
Customer Impact	5.4.3 DCPSC to Work with Pepco to Enhance Customer Data Access and Protection	2.20

Table 6. 14 – Recommendations with Highest Well-Planned Principle Score

All recommendations received an average score higher than 1 indicating stakeholders felt all recommendations had at least a weak positive impact on the Non-Discriminatory principle. Recommendation 5.1.1, DCPSC to Explore Metric for Evaluating Carbon Footprint of DER Projects, received the lowest score of 1.19 with most stakeholders feeling it had either no impact or a weak positive impact on the grid being Non-Discriminatory.

Again, Appendix A.11 provides a summary of all the data collected including graphical representation of the data sets. Data is sorted by working group and by each recommendation within that working group.

6.3 Recommendation Sequencing and Coordination Plan

As might be expected, an in depth review of the complete set of recommendations reveals many of the recommendations are interrelated and in certain circumstances recommendations are dependent on the completion of other recommendations. This section includes a discussion around these interdependencies and attempts to provide guidance on how the Commission can determine the most effective and appropriate sequencing of recommendation implementation. The MEDSIS Consultant leveraged the data gathered from the April joint working group meetings as documented in Sections 6.1 on recommendation timing and Section 6.2 on recommendation alignment to MEDSIS principles to establish the sequencing and coordination plan.

6.3.1 INITIAL RECOMMENDATIONS TO CONSIDER

While relative timing data was available (e.g, ST, MT, LT), this data did not indicate when recommendations should actually start. The MEDSIS Consultants used the following methodology to determine which recommendations should be started first:

Foundational items as identified in Section 6.1. This included recommendations and learnings for MEDSIS definitions, process recommendations on the Pilot Projects phase of the MEDSIS Initiative, specific MEDSIS pilot project ideas, and specific DCPSC directives in FC1130.

1. The establishment of definitions related to grid modernization is an important first step to implementing more substantive policy and process changes.
    a. Recommendation 5.2.1 DCPSC to Establish a NWA Definition
    b. Recommendation 5.2.4 DCPSC to Establish an Advanced Inverter Definition
    c. Learning 5.5.6 Need for Defining Resilience at the Distribution Level
2. The process recommendations out of the Pilot Project Working Group are critical steps towards the launch of the MEDSIS Pilot Project phase.
    a. Recommendation 5.6.1 DCPSC to Adopt Pilot Exclusions
    b. Recommendation 5.6.2 DCPSC to Adopt Pilot Project Selection Process with Two Step Screening
    c. Recommendation 5.6.3 DCPSC to Adopt Grant Funding Qualification Parameters
    d. Recommendation 5.6.4 DCPSC to Adopt the Pilot Projects Governance Model
2. The pilot project ideas out of the NWA and Microgrids Working Groups are also high priority and should be implemented in the short term, as they are part of the MEDSIS Pilot Project phase and are likely to educate the Commission on how to implement regulatory and business model structures of NWA and Microgrid projects in the District.
    a. Learning 5.2.6 Need for Demonstrating NWA Projects in the District

   b. Learning 5.5.10 Opportunity to Leverage MEDSIS Funds to Pilot Multi-Customer Microgrids in the District

2. Lastly, any recommendations or learnings that are related to DCPSC-specific directives in FC1130 should be considered high priority and implemented in the short term.
   a. Recommendation 5.2.4 – DCPCS to Establish Advanced Inverter Definition
   b. Learning 5.2.5 – Stakeholder Input on DCPSC Rules Around Ownership of DER

Once the initial set of recommendations were identified, an evaluation of the interdependencies between the various recommendations was conducted.

6.3.2 INTERRELATED RECOMMENDATIONS AND LEARNINGS AND DEPENDENCIES FOR SEQUENCING

All of the recommendations and learnings from Chapter 5 stand on their own and can be implemented regardless if other related recommendations are implemented. However, in reviewing the complete set of recommendations and learnings SEPA determined some recommendations and learnings were dependencies for other recommendations and learnings. SEPA defined dependencies as those recommendations and/or learnings that must be done prior to or in coordination with the specific recommendation being evaluated.

The following sections define, by working group, those recommendations and learnings that are interrelated. To visualize these relationships, diagrams were created for each set of interrelated recommendations and learnings. Solid lines in these diagrams represent recommendations/ learnings that should be coordinated to optimize their implementation. Solid lines with arrow tips represent recommendations and learnings that should be completed prior to other recommendations and learnings.

DIAA Working Group

The DIAA Working Group developed several interrelated recommendations and learnings. The DIAA Working Group recognized that the exploration of a carbon footprint impact evaluation may potentially overlap with the DCPSC development of a benefit cost analysis methodology, the initiation of a value of DER and value of grid study, and the alignment of MEDSIS with the Clean Energy DC Act. The DIAA Working Group also acknowledged the importance to continue the improvement of the interconnection process (Recommendation

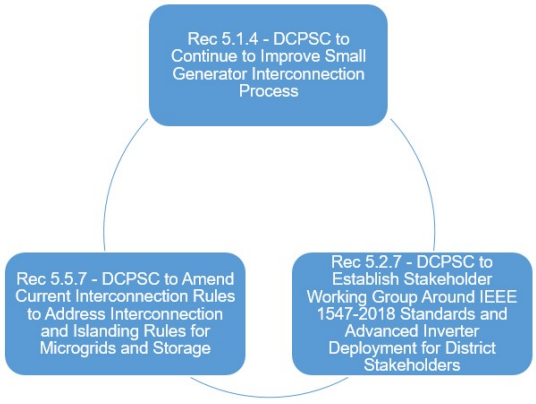

Figure 6.1 – Potential Coordination of Interconnection-related Recommendations

5.1.4). Recommendation 5.1.4 should be implemented in coordination with the other interconnection related recommendations coming from the working groups that involve specific microgrid and storage provisions (Recommendation 5.5.7) and a stakeholder working group effort to deploy advance inverters and implement IEEE 1547-2018 standards (Recommendation 5.2.7).

Recommendation 5.1.8 to direct Pepco to create a secure web portal should be implemented in coordination with of the stakeholder-informed distribution system planning and NWA consideration process (Recommendation 5.2.3). The implementation of the secure web portal must be done in coordination to ensure the successful launch of the DSP/NWA consideration process.

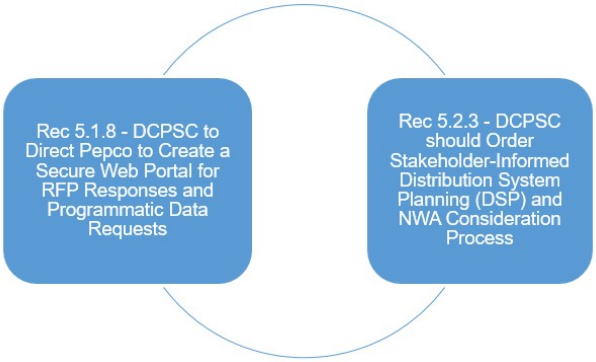

Figure 6.2 – Potential Coordination for Secure Web Portal Coordination with DSP/NWA Process

NWA Working Group

The NWA Working Group developed recommendations and learnings addressing the tools necessary to evaluate and consider NWA projects in the District. The recommendations and learnings also address where, when and how NWA can be appropriately integrated into the existing planning process. There are several foundational recommendations and learnings from this working group that should be executed immediately. Recommendation 5.2.1 and Recommendation 5.2.4 call for the DCPSC to establish definitions for NWA and Advanced Inverter, respectively. Prior to the convening of the IEEE 1547-2018 and advanced inverter stakeholder working group (Recommendation 5.2.7), the definition of Advanced Inverter should be established by the DCPSC. Recommendation 5.2.3 calling for a stakeholder-informed DSP and NWA consideration process should be implemented in coordination with identifying NWA

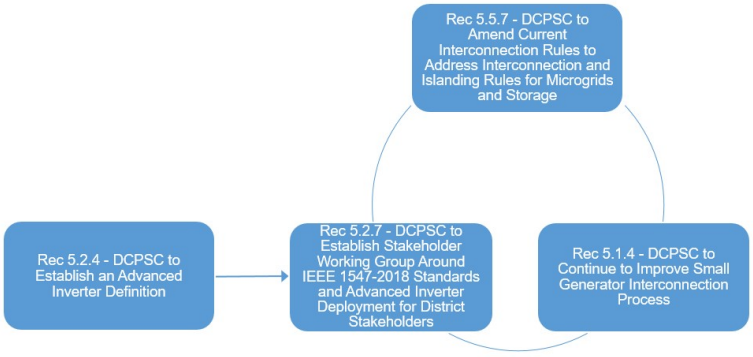

Figure 6.3 – Potential Coordination and Sequencing around the Advanced Inverter Definition, IEEE 1547-2018 Stakeholder Working Group and Interconnection-related Recommendations

classifications (Recommendation 5.2.2) and the development of the secure web portal (Recommendation 5.1.8). The NWA pilot project opportunity (Learning 5.2.6) as proposed by stakeholders could be executed in the District in coordination with the NWA classifications, ownership structures and process changes laid out in this section to help iterate and evolve the process. Prior to any pilot project implementation, the DCPSC must revise the CBOR for the pilot project process (Recommendation 5.4.6).

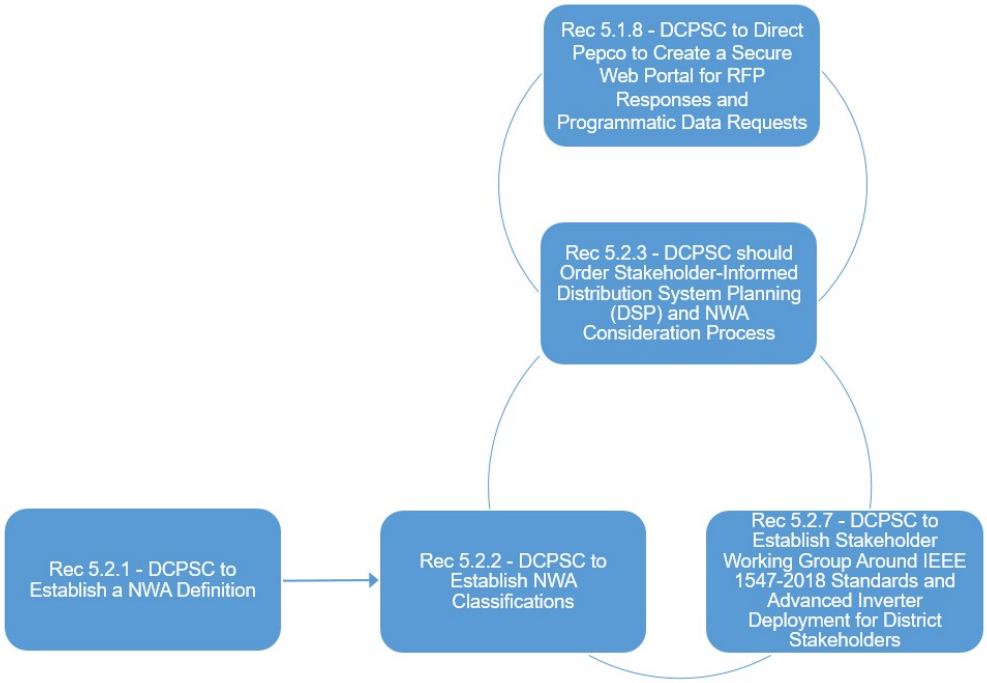

Figure 6.4 – Potential Coordination and Sequencing for Recommendations for NWA Definitions, Classifications, Pilot Project and Process Changes.

Rate Design Working Group

The Rate Design Working Group developed recommendations and learnings addressing opportunities to implement regulatory modifications or rate designs that would support the MEDSIS vision. The recommendation to reconvene the Dynamic Pricing working group is not dependent on any other recommendation and can be initiated on its own. Recommendation 5.3.2 to initiate a value of DER/ Grid study is interrelated with the need to create a metric for evaluating carbon footprint (Recommendation 5.1.1) and with the need to

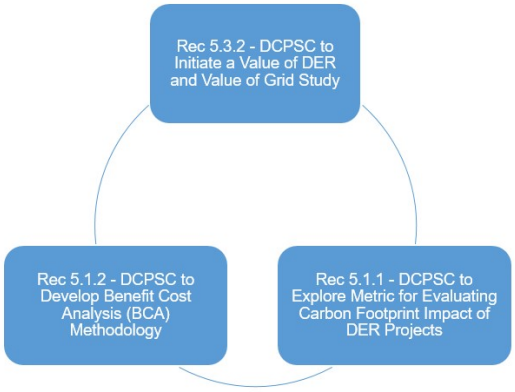

Figure 6.5 – Potential Value of DER, Carbon Impact Footprint and BCA Metric-related Recommendation Coordination

develop a benefit cost analysis framework (Recommendation 5.1.2).

Customer Impact Working Group

Several of the Customer Impact Working Group recommendations are interrelated since they all address customer oriented MEDSIS principles of Affordability and Interactive. Recommendations to consolidate and enhance customer education material (Recommendation 5.4.1) and competitive energy supplier information (Recommendation 5.4.2) are closely related and should be coordinated. Similarly, the recommendations to initiate an EE program for master metered apartments (Recommendation 5.4.4) and to consolidate and ensure customer participation in LI programs (Recommendation 5.4.5) are closely interrelated. Recommendation 5.4.3 to enhance customer data access and protection is independent from but connected conceptually to the need to provide access to publically available system level data (Recommendation 5.1.6). It is also related with the need to ensure a connection between a customer's energy usage and their environmental impact (Recommendation 5.4.8) but does not need to be coordinated from an implementation standpoint.

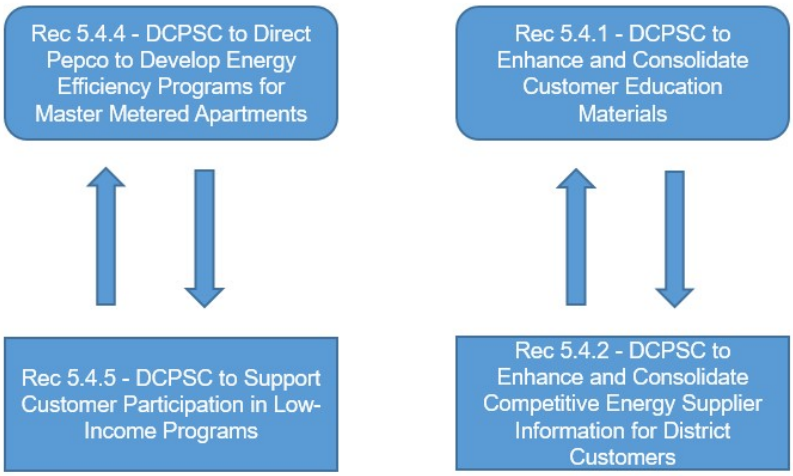

Figure 6.6 – Potential Customer Education Material-related Recommendation Coordination

Recommendation 5.4.6 to revise the CBOR to support the MEDSIS pilot projects phase is interrelated to the development regulatory attributes of a microgrid operator (Recommendation 5.5.3), the need to create a microgrid customer rate/ tariff (Recommendation 5.5.4), and the complaint process for third party operated microgrids (Recommendation 5.50). This is depicted in Figure 6.7 in the Microgrid section below. This recommendation is also a prerequisite to fully implementing the pilot projects selection process (Recommendation 5.6.2), the pilot projects governance process (Recommendation 5.6.4), and to initiating any of the recommended pilot projects (Recommendations 5.2.6 and 5.5.10) as shown in Figure 6.8 in the Pilot Projects section.

Microgrids Working Group

The Microgrids Working Group puts forth regulatory recommendations for microgrids serving multiple customers (Recommendation 5.5.3) and recommendations for an appropriate microgrid customer tariff structure (Recommendation 5.5.4). Learning 5.3.1 and 5.3.2 identifies the need for the DCPSC to leverage existing standards to develop a regulatory framework for Microgrids in the District. These two learnings should naturally feed into Recommendation 5.5.3. The working group also identified the opportunity to pilot a multi-customer microgrid (Learning 5.5.10). A pilot could be instrumental in determining the appropriate set of regulations necessary for multi-customer microgrids as well as establishing an appropriate customer microgrid schedule or tariff structures, and should be implemented in coordination with Recommendation 5.5.3 and 5.5.4. Prior to any pilot projects, it is critical that the CBOR is revised for pilot project implementation (Recommendation 5.4.6). The working group also developed a recommendation for the DCPSC and DC Council to modify their methodology on calculating surcharges on District customers' bills (Recommendation 5.5.8) that should be coordinated with the development of a microgrid schedule or tariff structures (Recommendation 5.5.4). Similarly to the other interconnection related recommendations, Recommendation 5.5.7 around provisions for microgrids and storage for the interconnection process should be implemented in coordination with the other interconnection related recommendations, Recommendation 5.1.4 and 5.2.7.

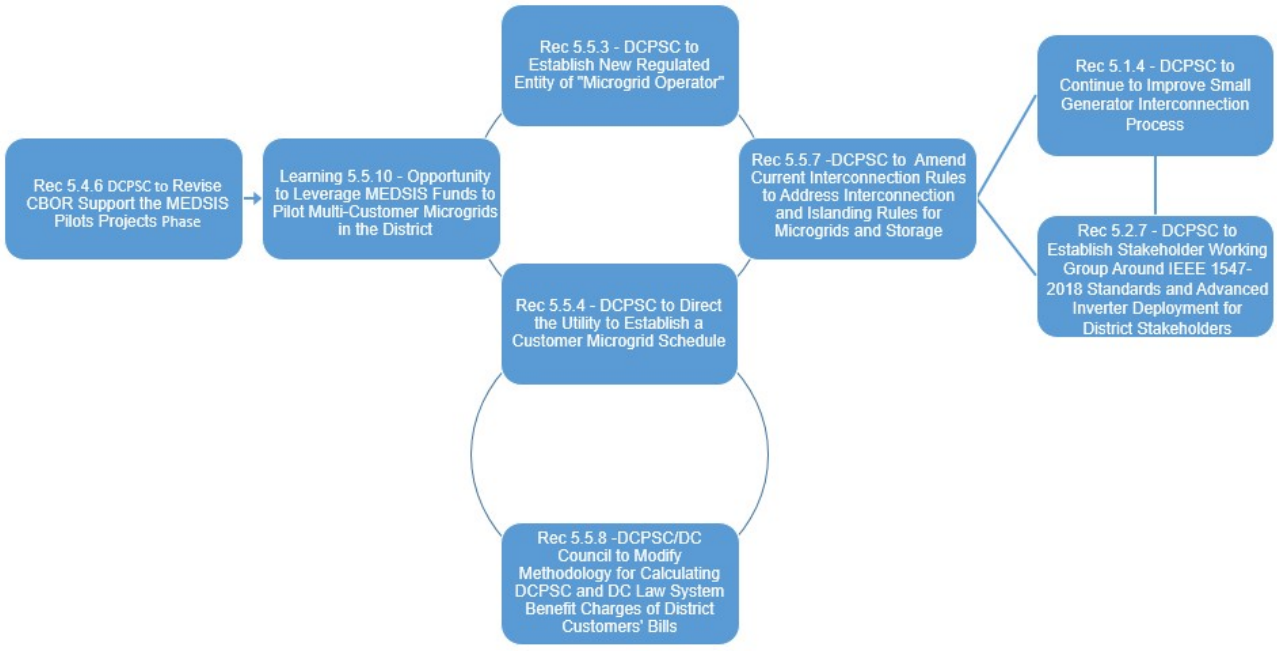

Figure 6.7 – Potential Microgrid Recommendation Sequencing and Coordination

Pilot Projects Working Group

The recommendations developed by the Pilot Projects working group are all process oriented recommendations that are mostly interrelated with themselves. The recommendations to adopt specific pilot project exclusions (Recommendation 5.6.1), adopt a two-step screening process (Recommendation 5.6.2), and to adopt grant funding parameters (Recommendation 5.6.3) are all closely interrelated. Similarly, the pilot projects governance model (Recommendation 5.6.4) is interrelated with the two step screening process (Recommendation 5.6.3).

Recommendation 5.6.2 to implement a two-step screening process best exemplifies how a recommendation can be dependent on other recommendations. It is dependent on the Commission first adopting specific pilot project exclusions (Recommendation 5.6.1), adopting grant funding parameters (Recommendation 5.6.3), adopting a pilot governance model (Recommendation 5.6.4), and revising the CBOR for pilots (Recommendation 5.4.6).

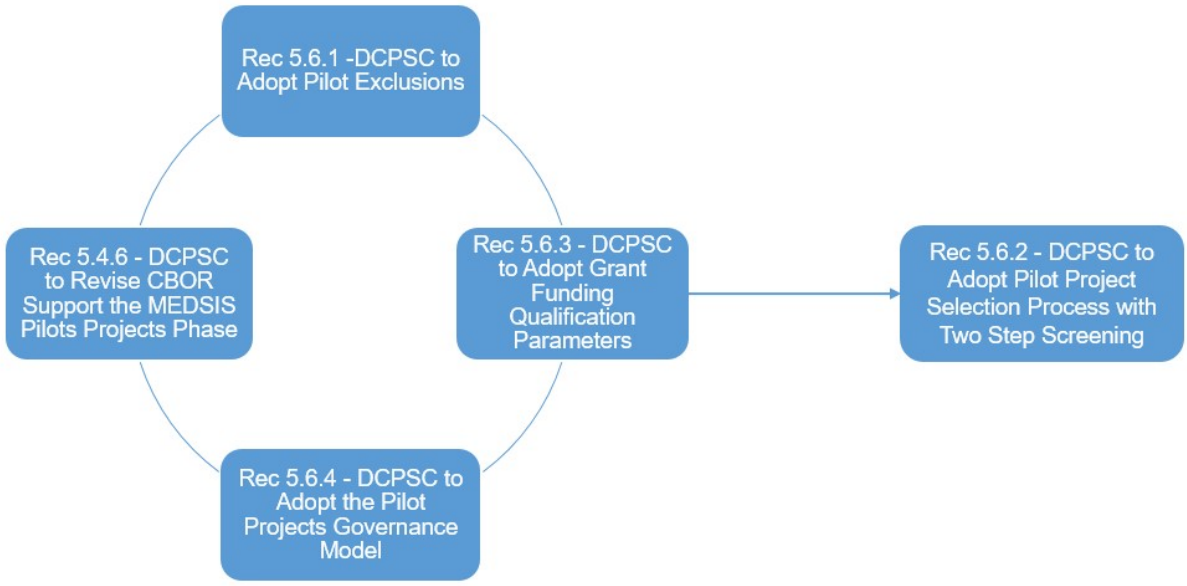

Figure 6.8 – Potential Coordination and Sequencing of Pilot Project Recommendations

6.3.3 COORDINATION AND SEQUENCING PLAN

With an understanding of the recommendations that need to be initially implemented and an understanding of the interdependencies of the remaining recommendations, a coordination and sequencing plan was developed. This resulted in two valuable outputs for Commission consideration. Table 6.15 below combines the data from Section 6.1 and 6.2 along with data presented in Sections 6.3.1 and 6.3.2 to define how recommendations should be coordinated. The recommendations are listed by highest MEDSIS alignment score along with their timing designation and dependencies.

Recommendation	Alignment Score	Timing (ST, ST to MT, MT, MT to LT, LT)	Dependencies
5.2.7 DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders	14.64	MT	5.1.4, 5.2.4, 5.5.7
5.1.4 DCPSC to Continue to Improve Small Generator Interconnection Process	14.38	ST	5.2.4, 5.1.4, 5.5.7
5.3.1 DCPSC to Reconvene Dynamic Pricing Working Group	14.20	ST to MT	None
5.5.7 DCPSC to Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids and Storage	14.15	MT	5.1.4, 5.2.7
5.4.5 DCPSC to Support Customer Participation in Low-Income Programs	14.15	ST	None
5.4.4 DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments	13.71	MT	None
5.1.7 DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis	13.67	ST	None
5.1.8 DCPSC to Direct Pepco to Create a secure web portal for RFP Responses and Programmatic Data Requests	13.50	MT	5.2.3
5.4.3 DCPSC to Work with Pepco to Enhance Customer Data Access and Protection	13.47	ST to MT	None

Recommendation	Alignment Score	Timing (ST, ST to MT, MT, MT to LT, LT)	Dependencies
5.1.6 DCPSC to Develop Publicly Available System-Level Data Webpage	13.36	ST	None
5.2.3 DCPSC Should Order a Stakeholder-Informed DSP and NWA Consideration Process	13.29	MT	5.1.8
5.3.2 DCPSC to Initiate a Value of DER and Value of Grid Study	13.20	MT to LT	None
5.4.1 DCPSC to Enhance and Consolidate Customer Education Materials	13.00	ST	5.4.2
5.5.3 DCPSC to Establish New Regulated Entity of "Microgrid Operator"	12.86	MT to LT	5.2.5, 5.5.4, 5.5.7, 5.5.10
5.4.8 DCPSC to Ensure Connection Between Customer Energy Usage and Their Environmental Impact	12.85	MT**	None
5.5.4 DCPSC to Direct the Utility to Establish a Customer Microgrid Schedule	12.35	MT to LT	5.5.3, 5.5.7, 5.5.8, 5.5.10
5.1.2 DCPSC to Develop Benefit Cost Analysis (BCA) Methodology	12.27	MT	None
5.1.3 DCPSC to Align MEDSIS with Clean Energy DC Act	12.25	ST to MT	None
5.4.2 DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers	11.53	ST	5.4.1
5.5.8 DCPSC/DC Council to Modify Methodology for Calculating DCPSC and DC Law Surcharges of District Customers' Bills	11.17	MT to LT	5.5.4
5.1.1 DCPSC to Explore Metric for Evaluating Carbon Footprint of DER Projects	10.90	ST to MT	None
5.4.6 DCPSC to Revise CBOR Support the MEDSIS Pilots Projects Phase	10.87	MT	None

Recommendation	Alignment Score	Timing (ST, ST to MT, MT, MT to LT, LT)	Dependencies
5.5.5 DCPSC to Determine How Utilities Recover Costs of Microgrid Assets	9.30	MT	None
5.1.5 DCPSC to Revise Language in MEDSIS Vision Statement	N/A	ST	None
5.1.9 Apply MEDSIS Guiding Principle Metrics for General DCPSC Decision Making	N/A	ST	None
5.1.10 Learning: Balance System-Level Data Availability with Security and Affordability	N/A	N/A	N/A
5.2.1 DCPSC to Establish a NWA Definition	N/A	F	None
5.2.2 DCPSC to Establish NWA Classifications	N/A	ST	5.2.1
5.2.4 DCPSC to Establish an Advanced Inverter Definition	N/A	F	None
5.2.5 Learning: Stakeholder Input on DCPSC Rules Around Ownership of DERs	N/A	F	None
5.2.6 Learning: Need for Demonstrating NWA Projects in the District	N/A	F	5.4.6, 5.2.2, 5.2.3, 5.2.5, 5.2.6
5.3.3 Learning: Stakeholder Input on Performance Based Regulation in the District	N/A	N/A	N/A
5.4.7 Learning: Opportunity for Resilience Hubs in the District	N/A	N/A	None
5.5.1 Learning: List of Microgrid Assets and Classifications in the District	N/A	N/A	N/A
5.5.2 Learning: Need for Establishing a Regulatory Framework in the District and Leveraging Existing DCPSC & DC Government Standards	N/A	N/A	N/A

Recommendation	Alignment Score	Timing (ST, ST to MT, MT, MT to LT, LT)	Dependencies
5.5.6 Learning: Opportunity to Define Resilience at the Distribution Level	N/A	F	None
5.5.9 Learning: Need to Define a Customer Complaint Process for Assets that are Leased or Operated by Third-Party	N/A	N/A	N/A
5.5.10 Learning: Opportunity to Leverage MEDSIS Funds to Pilot Multi-Customer Microgrids in the District	N/A	F	5.4.6
5.6.1 DCPSC to Adopt Pilot Exclusions	N/A	F	None
5.6.2 DCPSC to Adopt Pilot Project Selection Process with Two Step Screening	N/A	ST*	5.4.6, 5.6.1, 5.6.4
5.6.3 DCPSC to Adopt Grant Funding Qualification Parameters	N/A	ST*	5.6.1, 5.6.2
5.6.4 DCPSC to Adopt the Pilot Projects Governance Model	N/A	ST*	None

Table 6. 15 – Recommendation Coordination Summary Table

Figure 6.9 below provides a sequencing plan that graphically depicts how recommendations could be implemented over time. This sequencing plan is illustrative and not a recommended implementation plan. It does however, provide an indication of how all recommendations could potentially be sequenced to occur. Recommendations are grouped by working group. Figure 6.9 also includes the recommended timeframe for conducting the Pilot Projects phase of MEDSIS. This recommended timing for the Pilot Project Phase is documented in more detail in Recommendation 5.6.2.

MEDSIS Recommendation Sequencing	2019				2020				2021				2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
5.1.1 DCPSC to Explore Metric for Evaluating Carbon Footprint Impact of DER Projects																								
5.1.2 DCPSC to Develop Benefit Cost Analysis (BCA) Methodology																								
5.1.3 DCPSC to Align MEDSIS with Clean Energy DC Act																								
5.1.4 DCPSC to Continue to Improve Small Generator Interconnection Process																								
5.1.5 DCPSC to Revise Language in MEDSIS Vision Statement																								
5.1.6 DCPSC to Develop Publicly Available System-Level Data Web-page																								
5.1.7 DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis																								
5.1.8 DCPSC to Direct Pepco to Create a Secure Web Portal for RFP Responses and Programmatic Data Requests																								
5.1.9 Apply MEDSIS Guiding Principle Metrics for General DCPSC Decision Making																								
5.2.1 DCPSC to Establish a NWA Definition																								
5.2.2 DCPSC to Establish NWA Classifications																								
5.2.3 DCPSC Should Order a Stakeholder-Informed DSP and NWA Consideration Process																								
5.2.4 DCPSC to Establish an Advanced Inverter Definition																								
5.2.5 Learning: Stakeholder Input on DCPSC Rules Around Ownership of DERs																								
5.2.6 Learning: Need for Demonstrating NWA Projects in the District																								
5.2.7 DCPSC to Establish Stakeholder Working Group Around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders																								
5.3.1 DCPSC to Reconvene Dynamic Pricing Working Group																								
5.3.2 DCPSC to Initiate a Value of DER and Value of Grid Study																								
5.4.1 DCPSC to Enhance and Consolidate Customer Education Materials																								
5.4.2 DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers																								
5.4.3 DCPSC to Work with Pepco to Enhance Customer Data Access and Protection																								

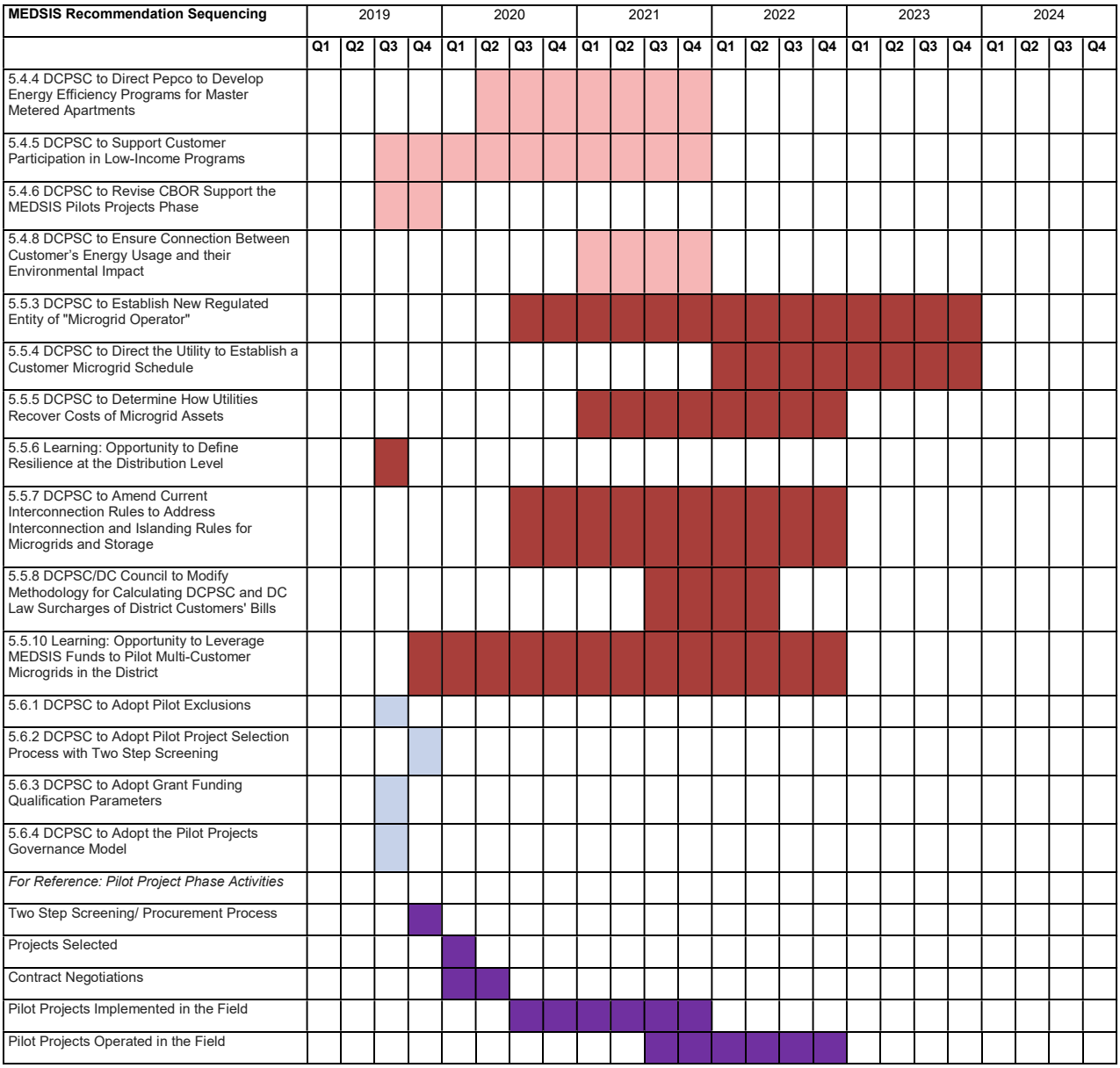

Figure 6.9 – Illustrative MEDSIS Recommendation Sequencing through 2024

The DCPSC should leverage the data in Table 6.15 and Figure 6.9 when determining when to implement the recommendations and learnings outlined in this report.

A Appendix

A.1 - Meeting Matrix

MEDSIS Meeting Agendas for August – December, 2018

Date	DIAA	NWA	Rate Design	Customer Impact	Microgrids	Pilots
Aug	Charter Development	NA	Charter Development	Charter Development	Charter Development	NA
Sep	Roadmap Framework (U.S. DOE)	NA	Alternative Rate Design (Brattle Group)	DER Cost/Benefit Framework (NY PSC)	Microgrid Cost Benefit Elements (EPRI)	NA
Oct	U.S. DOE Chevron Measurable Objectives (Part 1)	Charter Development	PBR Deep Dive (RAP) Rate's in D.C. (Pepco)	Customer Engagement and Education in D.C. (OPC, Arcadia Power, Pepco, Oracle Utilities)	D.C. Perspectives and Microgrid Classification, Ownership and Customer Standards (US GSA & DCPSC)	Charter Development
Nov	Measurable Objectives (Part 2)	NWA Definitions, Types and Goals/Purpose (Navigant)	Performance Based Regulation Session 1 (ConEd, RI PUC)	DERs and Low Income Customers (OPC, DCSEU, Nest, Grid Alternatives, TBD)	Microgrid Regulatory Landscape and Microgrid Classifications (GWU, TBD)	Review of Existing MEDSIS Pilot Criteria (DCPSC)
Dec	NA	NWA Process Session Part 1 (Suitability Requirements, 3rd Party Involvement, Load Forecasting, BCA, TBD)	Performance Based Regulation Session 2 (TBD)	Customer Focused Grid and Customer Platform (TBD)	Microgrid Business Models and Regulations (TBD)	Pilot Criteria in Other Jurisdictions (TBD)

MEDSIS Meeting Agendas for January – May, 2019

Date	DIAA	NWA	Rate Design	Customer Impact	Microgrids	Pilots
Jan	System-level Data Part 1 - Availability & Needs for MEDSIS and the Cost and Security Implications (GridUnity, MKACyber and Greentel Group)	NWA Process Part 1 - Distribution System Planning and NWA Consideration (Pepco)	Alternative Rate Designs Part 1 (TBD)	Customer Data Access and Protection – Part 2 (3rd Parties)	Hybrid Microgrid Pilots, Business Models and Regulatory Treatment (Navigant)	Pilots Projects Evaluation Strawman (TBD)
Feb	NA	DER Ownership Energy Storage Business Models and NWA Process Part 2 (ESA, Tesla and Pepco)	Alternative Rate Design Part 2 (TBD)	Customer Engagement Case Study and OPC Recommendation Review(TBD)	Third-Party Microgrid Pilots, Business Models and Regulatory Treatment	Governance Model and Strawmen Recommendations
Mar	System-Level Data Part 2, Draft Recommendations Coordination Plan, and Review Draft Recommendations	Advanced Inverter Definition, NWA Suitability, NWA Contracts and Risk and Potential Pilots, Review and Develop Draft Recommendations	Review and Develop Draft Recommendations	Review and Develop Draft Recommendations	Microgrid Pilots, Business Models and Regulatory Treatment Revisited and Review and Develop Draft Recommendations	Review and Develop Draft Recommendations
Apr	Joint Working Group Meetings – MEDSIS Final Report Workshop	Joint Working Group Meetings – MEDSIS Final Report Workshop	Joint Working Group Meetings – MEDSIS Final Report Workshop	Joint Working Group Meetings – MEDSIS Final Report Workshop	Joint Working Group Meetings – MEDSIS Final Report Workshop	Joint Working Group Meetings – MEDSIS Final Report Workshop
May	Review Final Recommendations	Review Final Recommendations	Review Final Recommendations	Review Final Recommendations	Review Final Recommendations	Review Final Recommendations

A.2 - List of Stakeholder Participants

First	Last	Company
Irvine	Sloan	ABB, Inc.
Suzanna	Graziano	ACCES
H.G.	Chissell	Advanced Energy Group
Michael	House	AECOM
Ida	Namer	AECOM
Sean	Casey	AECOM
Shelley	Cohen	Alpha Solar Group
Soam	Goel	Anabaric
April	Kreller	Apartment and Office Building Association of Metropolitan Washington (AOBA)
Excetral	Caldwell	Apartment and Office Building Association of Metropolitan Washington (AOBA)
Frann	Francis	Apartment and Office Building Association of Metropolitan Washington (AOBA)
Keith	Townsend	Apartment and Office Building Association of Metropolitan Washington (AOBA)
Richard	Caperton	Arcadia Power
Joel	Gamoran	Arcadia Power
Linda	Toth	Arup
Bicky	Corman	Bicky Corman Law, PLLC
Phil	Flaherty	Bidgely

First	Last	Company
Ben	Shlansky	Bidgely
Jordana	Temlock	Bidgely
Ben	Schlansky	Bidgely
Sanem	Sergici	Brattle Group
Mike	Gravely	California Electric Commission
Paul	Van Gelder	CHA Consulting
David	Schatz	ChargePoint
Tom	Jones	Chesapeake Company on Energy
Mishal	Thadani	Coalition for a Resilient DC
Torrey	Beek	Company for Individuals
Balvinder	Deonarine	ConEdison
Lori	Lybolt	ConEdison
Whitman	Fulton	ConnectDER
Nina	Dodge	DC Climate Action
John	Macgregor	DC Climate Action
Kenley	Farmer	DC Department of Energy & Environment (DOEE)
Alexandra	Fisher	DC Department of Energy & Environment (DOEE)
Edward	Yim	DC Department of Energy & Environment (DOEE)
Alex	Lopez	DC Department of Energy & Environment (DOEE)
Lance	Loncke	DC Department of Energy and Environment (DOEE)

First	Last	Company
Frank	Caldwell	Office of the Attorney General for the District of Columbia
Melisa	Dias	DC Department of Energy & Environment (DOEE)
Keishaa	Austin	District of Columbia Office of the Peoples Counsel (DCOPC)
Barbara	Burton	District of Columbia Office of the Peoples Counsel (DCOPC)
Jason	Cumberbatch	District of Columbia Office of the Peoples Counsel (DCOPC)
Thaddeus	Johnson	District of Columbia Office of the Peoples Counsel (DCOPC)
Yohannes	Mariam	District of Columbia Office of the Peoples Counsel (DCOPC)
Adrienne	Mouton-Henderson	District of Columbia Office of the Peoples Counsel (DCOPC)
Anjali	Patel	District of Columbia Office of the Peoples Counsel (DCOPC)
Matthew	Mercogliano	District of Columbia Public Service Commission (DCPSC)
Craig	Berry	District of Columbia Public Service Commission (DCPSC)
John	Howley	District of Columbia Public Service Commission (DCPSC)

First	Last	Company
Grace	Hu	District of Columbia Public Service Commission (DCPSC)
Alp	Keceli	District of Columbia Public Service Commission (DCPSC)
Poorani	Ramachandran	District of Columbia Public Service Commission (DCPSC)
Naza	Shelley	District of Columbia Public Service Commission (DCPSC)
Rick	Fluerry	District of Columbia Sustainable Energy Utility (DCSEU)
Patti	Boyd	District of Columbia Sustainable Energy Utility (DCSEU)
Andrew	Shaw	District of Columbia Sustainable Energy Utility (DCSEU)
Theodore	Trabue	District of Columbia Sustainable Energy Utility (DCSEU)
Anmol	Vanamali	District of Columbia Sustainable Energy Utility (DCSEU)
Marcus	Walker	District of Columbia Sustainable Energy Utility (DCSEU)
John	Young	District of Columbia Sustainable Energy Utility (DCSEU)
Shelly-Ann	Maye	Diversified Energy Regulatory Consulting, LLC
Patrick	Morand	Duane Morris LLP

First	Last	Company
Kush	Patel	E3
Chinyere	Osuala	Earthjustice
John	Caldwell	Edison Electric Institute (EEI)
Kwame	Canty	Edison Electric Institute (EEI)
Molly	Garcia	Edison Electric Institute (EEI)
Lola	Infante	Edison Electric Institute (EEI)
Bill	Pfister	Edison Electric Institute (EEI)
Alison	Williams	Edison Electric Institute (EEI)
Deana	Dennis	Electric Power Research Institute (EPRI)
Wil	Smith	Electric Power Research Institute (EPRI)
Jeffrey	Roark	Electric Power Research Institute (EPRI)
Jigar	Shah	Electrify America
Anne	McKibbin	Elevate Energy
Sarah	Gulezian	Elevate Energy
Eric	Hoevenaars	Enbala Power Networks
Brian	Kauffman	Enel X
Tom	Ries	Energy Forward, LLC
Mehdi	Ganji	Energy Solutions
Jason	Burwen	Energy Storage Association (ESA)
Nitzan	Goldberger	Energy Storage Association (ESA)
Aaron	Snyder	EnerNex LLC

First	Last	Company
Michael	Engleman	Engleman Fallon, PLLC
Blake	Elder	EQ Research
Michael	Krauthamer	EV Advisors, LLC
Christopher	Budzynski	Exelon Utilities
Hilary	Pearson	Exelon Utilities
John	Slocum	Exelon Utilities
Patrick	Ryan	Exelon Utilities
Austin	Whitman	First Fuel Software
Ray	Hohenstein	Fluence
Larisa	Dobriansky	General MicroGrids, Inc.
Kelsey	Oliver	George Washington University
Donna	Attanasio	George Washington University Law
Matthew	Goetz	Georgetown Climate Center
Andrew	Tanner	GreenSync
Alexandra	Wyatt	GRID Alternatives MidAtlantic
Alex	Dinkel	Grid Unity
Brian	Fitzsimons	Grid Unity
Dan	Situ	Grid Unity
Jake	Z	Grid Unity
Eugene	Imhoff	GRID2.0
Larry	Martin	GRID2.0

First	Last	Company
Jeremy	Bedine	GridLion
Ladeene	Freimuth	GridWise Alliance
Mark	Ewing	General Services Administration (GSA)
Lisa	Schmidt	Home Energy Analytics
Patti	Cooke	ICF International, Inc.
Bob	Mac	ICF International, Inc.
Jake	Berlin	ICF International, Inc.
Puneeth	M V Reddy	ICF International, Inc.
Walter	Rojowsky	ICF International, Inc.
Surhud	Vaidya	ICF International, Inc.
Cooper	Wetherbee	ICF International, Inc.
Emily	Moss	Independent
Kelly	Crandall	Institute for Market Transformation
Sylwia	Bialek	Institute for Policy Integrity, New York University
Burcin	Unel	Institute for Policy Integrity, New York University
Karen	Walland	KLM Strategies
Clark	Pierce	Landis+Gyr
Jeffrey	Stottlemyer	Metro DC DSA
Shalom	Flank	Microgrid Architect
Christopher	Berendt	Microgrid Resources Coalition (MRC)
Michael	Murray	Mission Data

First	Last	Company
Mischel	Kwon	MKA Cyber
Ken	Kulak	Morgan, Lewis & Bockius LLP
Kerry	Worthington	National Association of Regulatory Utility Commissioners (NARUC)
Stacey	Rantala	National Energy Marketers Association
Tony	Thomas	National Rural Electric Cooperative Association (NRECA)
Tracy	Warren	National Rural Electric Cooperative Association (NRECA)
Jessie	Mehrhoff	Navigant Consulting, Inc.
Rick	Counihan	Nest
Nicholas	Bihun	New Columbia Solar
Paige	Ober	New Columbia Solar
Bryan	Long	NRG Energy, Inc. (NRG)
Steve	Swern	NV5 Global, Inc.
Warren	Myers	NY Department of Public Services
Brian	Caldwell	Office of the Attorney General for the District of Columbia
William	Snape III	Office of the Attorney General for the District of Columbia
Darcy	Laronde	OPAL-RT Technologies Inc.
Cameron	Brooks	Opus One Solutions

First	Last	Company
Zach	Pollock	PA Consulting Group
Chet	Warner	Pareto Energy LTD
Guy	Warner	Pareto Energy LTD
Tanya	Barham	Pedernales Electric Cooperative
Lilia	Abron	PEER Consultants, PC
Jamie	Statter	PEER Consultants, PC
Amrita	Acharya-Menon	Pepco Holdings, Inc.
Peter	Blazunas	Pepco Holdings, Inc.
Brian	Doherty	Pepco Holdings, Inc.
Jean	Gray	Pepco Holdings, Inc.
Jennifer	Grisham	Pepco Holdings, Inc.
Donald	Hall	Pepco Holdings, Inc.
Andrea	Harper	Pepco Holdings, Inc.
Kim	Hassan	Pepco Holdings, Inc.
Ethan	Holmes	Pepco Holdings, Inc.
Dennis	Jamouneau	Pepco Holdings, Inc.
Dena	Jefferson	Pepco Holdings, Inc.
Susan	Mora-Schrader	Pepco Holdings, Inc.
Tom	Shetty	Pepco Holdings, Inc.
Robert	Stewart	Pepco Holdings, Inc.
Chris	Taylor	Pepco Holdings, Inc.

First	Last	Company
Tyler	Wolverton	Pepco Holdings, Inc.
Joe	Janoch	Pepco Holdings, Inc.
Stephen	Sunderhauf	Pepco Holdings, Inc.
Wayne	Hudders	Pepco Holdings, Inc.
Steve	Steffel	Pepco Holdings, Inc.
Will	Davis	Pepco Holdings, Inc.
Julio	Aguiler	Pepco Holdings, Inc.
Noel	Riveria	Pepco Holdings, Inc.
Wes	Davis	Pepco Holdings, Inc.
Netti	Leone	Pepco Holdings, Inc.
Lance	Schafer	Pepco Holdings, Inc.
Doris	Negron	Pepco Holdings, Inc.
Stephen	DuBrey	Pepco Holdings, Inc.
Terry	Hill	PHIUS and Emerge Alliance Boards
Scott	Baker	PJM Interconnection
Lori	Lee	PJM Interconnection
Andrew	Levitt	PJM Interconnection
Chris	Villarreal	Plugged in Strategies
Hanna	Greene	PXiSE
Beth	Rolls Mathewson	PXiSE

First	Last	Company
Nick	Burger	RAND Corporation
Mini	Lam	Recurrent Innovative Solutions, LLC
David	Littel	Regulatory Assistance Project (RAP)
Roger	Green	Retired
Bruce	Oliver	Revilo Hill Associates
Tim	Oliver	Revilo Hill Associates
Todd	Bianco	Rhode Island PUC
Josh	Cohen	SemaConnect
Bonnie	Datta	Siemens
Chris	King	Siemens
Clark	Wiedetz	Siemens
Peter	Quinn-Jacobs	Sierra Club DC Chapter
Erica	Weyer	Sierra Club DC Chapter
Matthew	Bearzotti	Solar United Neighbors
Anya	Schoolman	Solar United Neighbors
Randy	Speck	Solar United Neighbors
John	Raftery	Southern California Edison
Ryan	Storke	Storke, LLC
Stephen	Lassiter	Sunrun Inc.
Steven	Rymsha	Sunrun Inc.
Steve	D'Angelo	Tangent Energy

First	Last	Company
Patrick	Bean	Tesla
Betty	Watson	Tesla
Ashik	Siddique	The Climate Mobilization
Nikhil	Balakumar	The Greentel Group
Charles	Bauman	The Northbridge Group
Neil	Fisher	The Northbridge Group
Scott	Fisher	The Northbridge Group
Mark	Thomson	ThinkEco
Lariza	Sepulveda	United States General Services Administration
Joe	Paladino	US DOE
Daniel	Fredman	Vermont Energy Investment Corporation (VEIC)
David	Hill	Vermont Energy Investment Corporation (VEIC)
Tom	McCarran	Vermont Energy Investment Corporation (VEIC)
David	Borden	Washington Gas
Daniel	Lee	Washington Metropolitan Area Transit Authority (WMATA)
Dan	Delurey	Wedgemere Group
Mark	Bailey	WGL Energy
Bernice	McIntyre	WGL Energy
Tony	Soruco	WGL Energy
Andrew	McCornack	Willdan Corporation

First	Last	Company
Zachary	Suttile	Willdan Corporation

A.3 - List of Subject Matter Experts

First	Last	Company
Frank	Caliva	ACCESS
Suzanna	Graziano	ACCESS
Richard	Caperton	Arcadia Power
Sanem	Sergici	Brattle Group
Mike	Gravely	California Electric Commission
Tom	Jones	Chesapeake Company on Energy
Balvinder	Deonarine	ConEdison
Lori	Lybolt	ConEdison
Melisa	Dias	DC Department of Energy & Environment (DOEE)
Kenley	Farmer	DC Department of Energy & Environment (DOEE)
Alex	Lopez	DC Department of Energy & Environment (DOEE)
Adrienne	Mouton-Henderson	District of Columbia Office of the People's Counsel (DCOPC)
Thaddeus	Johnson	District of Columbia Office of the People's Counsel (DCOPC)
Naza	Shelley	District of Columbia Public Service Commission (DCPSC)
John	Howley	District of Columbia Public Service Commission (DCPSC)
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Patti	Boyd	District of Columbia Sustainable Energy Utility (DCSEU)
Theodore	Trabue	District of Columbia Sustainable Energy Utility (DCSEU)
Kush	Patel	E3

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Kwame	Canty	Edison Electric Institute (EEI)
Jeffrey	Roark	Electric Power Research Institute (EPRI)
Anne	McKibbin	Elevate Energy
Nitzan	Goldberger	Energy Storage Association (ESA)
Ray	Hohenstein	Fluence
Mark	Ewing	General Services Administration (GSA)
Donna	Attanasio	George Washington University Law
Alexandra	Wyatt	GRID Alternatives MidAtlantic
Alex	Dinkel	Grid Unity
Brian	Fitzsimons	Grid Unity
Lisa	Schmidt	Home Energy Analytics
Michael	Murray	Mission Data
Mischel	Kwon	MKA Cyber
Kenneth	Horne	Navigant Research
Erik	Gilbert	Navigant Research
Rick	Counihan	Nest
Warren	Myers	New York Department of Public Services
Peter	Blazunas	Pepco Holdings, Inc.
Tyler	Wolverton	Pepco Holdings, Inc.
Stephen	Sunderhauf	Pepco Holdings, Inc.
Brandon	Bowles	Pepco Holdings, Inc.
Wayne	Hudders	Pepco Holdings, Inc.
Susan	Mora	Pepco Holdings, Inc.
Dennis	Jamouneau	Pepco Holdings, Inc.
Susan	Mora	Pepco Holdings, Inc.
Joe	Janoch	Pepco Holdings, Inc.

First	Last	Company
Ethan	Holmes	Pepco Holdings, Inc.
David	Littel	Regulatory Assistance Project (RAP)
Todd	Bianco	Rhode Island Public Utility Commission
Brenda	Chew	Smart Electric Power Alliance (SEPA)
Steve	D'Angelo	Tangent Energy
Betty	Watson	Tesla
Christopher	Berendt	The Microgrid Resources Coalition
Joe	Paladino	United State Department of Energy
Shalom	Flank	Urban Ingenuity

A.4 - Working Group Charters

WG1: DATA INFORMATION ACCESS AND ALIGNMENT

1.0 PURPOSE AND SCOPE

The primary function of the Data and Information Access and Alignment (DIAA) working group (the "Group") is to assist the District of Columbia Public Service Commission (the "Commission") in fulfillment of its MEDSIS Vision Statement. This Charter shall govern the composition, leadership, responsibilities, and duties of this Group.

The Scope/ Description of the Microgrids Working Group is follows:

The Data and Information Access and Alignment (DIAA) Working Group will address measurable objectives of the MEDSIS Vision Statement with the Working Group process to develop an informed process for the Commission to make regulatory decisions. The Group will utilize the U.S. Department of Energy Grid Modernization Strategy roadmap to inform the overall MEDSIS Working Group process. This framework and roadmap will be the connective tissue that keeps the various MEDSIS Working Groups aligned and working toward a common goal. As part of the final deliverable, the Group will develop a coordination plan outlining the sequence and timing of policy recommendations coming out of each MEDSIS Working Group. The Group will also track and monitor interrelated cases and other sustainability initiatives in the District and how they relate to the MEDSIS Working Group process.

The Group will also function to coordinate data and information accessibility in the MEDSIS Working Group process. Under this function, the Group will identify, at a high level, system level data needs for distributed energy resources (DER) integration purposes and coordinate data and information between each of the MEDSIS Working Groups.

2.0 COMPOSITION

The Working Group shall be comprised of interested parties, stakeholders, and participants of the MEDSIS Initiative. The Group is open to any member of the public who would like to participate and accepts registrants on a rolling basis. Participants are required to first register on the MEDSIS Working Group Portal at dcgridmod.com in order to get access to relevant materials and meeting notices.

The Group's meetings and activities will be facilitated by SEPA Power ("Consultant").

3.0 TERM AND SCHEDULE

The Group shall be convened from August, 2018 – May, 2019. Working Group meetings will meet in August, September and October and during every other month thereafter. The actual schedule for each Working Group meeting is published on the dcgridmod.com website.

4.0 RESPONSIBILITIES AND DUTIES

By participating in the MEDSIS Working Group process, Group members agree to attend Group meetings, either in person or remotely. Group members agree to offer their perspectives and input during meetings and to respectfully consider and evaluate the input of other Group members. The Group will collectively review interim and final work products, when requested by Consultant, in accordance with the agreed upon schedule for completing those reviews.

The Group may also identify key resources that are needed to execute its tasks, including but not limited to: volunteer resources from its members and any additional paid technical resources requested along with ideas to cover the cost.

The Group shall produce the deliverables identified in Section 7.0.

The Group shall maintain a posting of its draft work products for Group member use only on the MEDSIS Working Group Workspace https://members.sgip.org/higherlogic/ws/groups/MEDSIS_WG-5. All interim or draft documents developed by the Group as well as all relevant stakeholder correspondence will be captured on this Workspace.

The Group shall maintain a posting of its finalized agendas, meeting minutes, interim and final deliverables on the MEDSIS Working Group Portal which will be accessible for all members of the public at dcgridmod.com.

5.0 KEY QUESTIONS TO ADDRESS

The Working Group will attempt to answer key questions that, if answered, would allow the Group to develop a MEDSIS roadmap for a sustainable energy delivery system in the District and to make recommendations to the Commission regarding delivery system and customer-level data that are consistent with the MEDSIS vision.

Therefore the Key Questions the Group will attempt to answer are as follows:

Grid Modernization Strategy and Common Framework

1. What are the guiding principles and measurable objectives for developing a common framework for a modernized energy delivery system with increased sustainability in the District?
2. How does the grid modernization strategy and common framework support the development of pilot projects?
3. How should the policy recommendations coming out of each MEDSIS Working Group be prioritized and sequenced?
4. How does the grid modernization strategy and common framework relate to ongoing cases before the Commission and can this inform future Commission decision making?

Data and Information Availability and Accessibility

1. What types of data (and at what level of granularity) must be provided to stakeholders to achieve the MEDSIS vision? Who will have access to each type?

2. What delivery system data is available and how can it be packaged for stakeholders to utilize to further the MEDSIS vision?
3. What customer data is available and how can it be packaged, anonymized and/or aggregated to utilize in order to further the MEDSIS vision?
4. How will customer protection, privacy and security be ensured? (i.e. critical infrastructure and/or personally identifiable information)
5. What additional system level data is needed that isn't already available? For what purpose? At what cost?

6.0 Desired Outcomes

Upon conclusion of the Working Group activities in May, 2019, the Group will submit a report to the Commission outlining its development of the MEDSIS Grid Modernization Strategy and Common Framework and recommendations on how data and information availability and accessibility can occur in the District in a manner that is consistent with the MEDSIS vision.

The Group's Desired Outcomes from the Working Group process are:

Grid Modernization Strategy and Common Framework

1. Identify the guiding principles and measurable objectives for charting out a common framework for a modernized energy delivery system in the District.
2. Coordinate grid modernization strategy and framework with all MEDSIS Working Groups
3. Align strategy and framework with existing environmental, energy and climate change policy in the District.
4. Track ongoing cases before the Commission and provide recommendations to inform future Commission decision making.

Data and Information Availability and Accessibility

1. Identify the types of delivery system and customer data that must be provided to stakeholders to evolve the energy delivery system of the future.
2. Package and catalog delivery system and customer data to the stakeholder to further the MEDSIS vision.
3. Inform all MEDSIS Working Groups on data accessibility and availability progress of this Group
4. Identify additional system level data needed by each stakeholder to increase DER integration, outlining the purpose of obtaining the data as well as the cost and security implications

7.0 DELIVERABLES

The primary deliverable from the Group will be a final Working Group report to the Commission. The report will include the MEDSIS roadmap for a sustainable energy delivery system in the District and recommendations to the Commission regarding delivery system and customer-level data that are consistent with the MEDSIS vision. This report will be delivered to the Commission by the end of May, 2019.

The Working Group Consultant shall develop and publish agendas prior to each Working Group meeting as well as meeting minutes after every meeting. Additional artifacts, documents, presentations, reports, etc. as deemed relevant for the Group to complete its tasks may be produced by Consultant or Group members as mutually agreed upon by the Group members.

The final versions of all deliverables will be posted on the MEDSIS Working Group Portal at dcgridmod.com once approved by the Group members.

WG2: NON-WIRES ALTERNATIVES

1.0 PURPOSE AND SCOPE

The primary function of the Non-wires Alternatives to Grid Investments working group (the "Group") is to assist the District of Columbia Public Service Commission (the "Commission") in fulfillment of its MEDSIS Vision Statement. This Charter shall govern the composition, leadership, responsibilities, and duties of this Group.

The Scope/ Description of the Non-wires Alternatives to Grid Investments Working Group is follows:

The Non-wires Alternatives (NWA) to Grid Investments Working Group will start with defining the purpose and goals around NWAs in the District. The Group will address and make recommendations on the process, tools and information requirements needed to evaluate non-wires alternatives to conventional grid infrastructure investments for meeting system needs. An objective of this group includes identifying when, where and how – in the distribution system planning process – the utility and third-party providers can propose NWAs and the risks and compensations for NWAs.

The Group will consider utility access to and interaction with distributed energy resources (DERs) as defined by the Commission, including advanced inverters and regulation control equipment. The Group will specifically address utility ownership of DERs. The Group will help ensure that grid upgrades fully consider DERs for meeting system constraints prior to any grid infrastructure plans.

2.0 COMPOSITION

The Working Group shall be comprised of interested parties, stakeholders, and participants of the MEDSIS Initiative. The Group is open to any member of the public who would like to participate and accepts registrants on a rolling basis. Participants are required to first register on the MEDSIS Working Group Portal at dcgridmod.com in order to get access to relevant materials and meeting notices.

The Group's meetings and activities will be facilitated by SEPA Power ("Consultant").

3.0 TERM AND SCHEDULE

The Group shall be convened from October, 2018 – May, 2019. Working Group meetings will start in October and meet monthly through the entirety of the working group process. The actual schedule for each Working Group meeting is published on the dcgridmod.com website.

4.0 RESPONSIBILITIES AND DUTIES

By participating in the MEDSIS Working Group process, Group members agree to attend Group meetings, either in person or remotely. Group members agree to offer their perspectives and input during meetings and to respectfully consider and evaluate the input of other Group members. The Group will collectively review interim and final work products, when requested by Consultant, in accordance with the agreed upon schedule for completing those reviews.

The Group may also identify key resources that are needed to execute its tasks, including but not limited to: volunteer resources from its members and any additional paid technical resources requested along with ideas to cover the cost.

The Group shall produce the deliverables identified in Section 7.0.

The Group shall maintain a posting of its draft work products for Group member use only on the MEDSIS Working Group Workspace https://members.sgip.org/higherlogic/ws/groups/MEDSIS_WG-2. All interim or draft documents developed by the Group as well as all relevant stakeholder correspondence will be captured on this Workspace.

The Group shall maintain a posting of its finalized agendas, meeting minutes, interim and final deliverables on the MEDSIS Working Group Portal which will be accessible for all members of the public at dcgridmod.com.

5.0 KEY QUESTIONS TO ADDRESS

The Working Group will attempt to answer key questions that, if answered, would allow the Group to develop a set of recommendations to the Commission regarding the development of non-wires alternatives to grid investments for the energy delivery system in the District that are consistent with the MEDSIS vision.

Therefore the Key Questions the Group will attempt to answer are as follows:

1. What are the goals of NWAs in the District?
2. What are the consistent and verified processes, tools and information requirements for planning non-wires alternatives to grid investments in the District
    - What enhancements to the current utility distribution system planning processes (DIRP), tools and information requirements could be adopted to achieve the MEDSIS vision?
    - Where and how in the distribution planning process can Pepco list opportunities for third parties to suggest and/or propose NWAs?
    - What supplemental information not currently provided is needed to enhance the utility distribution planning process for all participants?
3. What other jurisdictions can the Commission learn from while addressing NWAs and what case studies and lessons learned can be adopted in the District?
4. Per the 1999 Act introducing competition to the retail sale of electricity in the District, Pepco is not allowed to own generation facilities in the District for the purpose of selling electricity. What should the rules around generation sourced from DERs be in the District? Topics to address:
    - Ownership
    - Operation

- Control
- Value and Costs
- Consumer Protection
- Reliability
- Cybersecurity
- Data access by all parties

5. Can battery storage installed to improve the economics of EV charging infrastructure also provide grid and/or locational benefits in the District?
6. What are the existing methodologies and frameworks that best assign and evaluate the benefits and costs of DERs for NWAs?
7. What is the definition of an “advanced inverter”?
8. What happens to risk in an NWA world?
    - How is risk defined in NWA?
    - Who bears the risk for NWA projects? How do you assign risk or compensate the bearer of increased risk without passing it on to consumers?
9. What are the revenue models and utility incentives to promote NWAs?
    - What are the allowable earning structures for third-party and utility NWA contracts?
10. What types of NWA pilot projects should the working group recommend for the Commission’s consideration?
    - What would be the purpose and desired outcomes/outputs of these NWA pilot projects?
    - What type of process is needed to shape the design and implementation of such pilots in order to gain the benefit of expert stakeholder inputs and to maximize lessons learned?

6.0 DESIRED OUTCOMES

Upon conclusion of the Working Group activities in May, 2019, the Group will submit a report to the Commission outlining its recommendations regarding the development of non-wires alternatives to grid investments in the District that are consistent with the MEDSIS vision.

The Group’s Desired Outcomes from the Working Group process are:

1. Develop a definition of NWA.

2. Identify the goals of NWAs in the District.
3. Review and provide input to the types of distribution system planning processes, tools and information requirements for Pepco to adopt (DIRP).
4. Articulate opportunities and make recommendations to the Commission regarding Pepco's distribution system planning process for collaboration to promote NWA consideration.
5. Study NWA models and best practices from other jurisdiction that are compatible with the District.
6. Identify the existing benefit cost analysis (BCA) frameworks for NWA and develop recommendations for shared, consistent methodologies for assigning benefits and costs of NWA.
7. Develop recommendations for the Commission to consider addressing utility ownership of DERs, including but not limited to energy storage devices.
8. Develop recommendations on how to define, obtain information about and deal with risk in an NWA environment.
9. Identify the revenue models and utility incentives that can be developed to promote NWA in the District.
10. Develop for the Commission's consideration a list of recommended NWA pilot projects.

7.0 DELIVERABLES

The primary deliverable from the Group will be a final Working Group report to the Commission. The report will include the recommendations to the Commission regarding the development of non-wires alternatives to grid investments for the energy delivery system in the District that are consistent with the MEDSIS vision. This report will be delivered to the Commission by the end of May, 2019.

The Working Group Consultant shall develop and publish agendas prior to each Working Group meeting as well as meeting minutes after every meeting. Additional artifacts, documents, presentations, reports, etc. as deemed relevant for the Group to complete its tasks may be produced by Consultant or Group members as mutually agreed upon by the Group members.

The final versions of all deliverables will be posted on the MEDSIS Working Group Portal at dcgridmod.com once approved by the Group members.

WG3: RATE DESIGN

1.0 PURPOSE AND SCOPE

The primary function of the Rate Design working group (the "Group") is to assist the District of Columbia Public Service Commission (the "Commission") in fulfillment of its MEDSIS Vision Statement. This Charter shall govern the composition, leadership, responsibilities, and duties of this Group.

The Scope/ Description of the Rate Design Working Group is follows:

The Rate Design Working Group will discuss rate structures and alternative rate designs and regulatory models to enable and support the advancement of the MEDSIS vision while maintaining just and reasonable rates. The Group will:

- *Investigate alternative rate design and regulatory models for the purpose of achieving the MEDSIS vision*
- Evaluate alternative rate designs and regulatory models with respect to, among other things, fundamental principles of ratemaking (e.g., cost causation, rate gradualism, etc.) as well as their effect on DER adoption

2.0 COMPOSITION

The Working Group shall be comprised of interested parties, stakeholders, and participants of the MEDSIS Initiative. The group is open to any member of the public who would like to participate and accepts registrants on a rolling basis. Participants are required to first register on the MEDSIS Working Group Portal at dcgridmod.com in order to get access to relevant materials and meeting notices.

The Group's meetings and activities will be facilitated by SEPA Power ("Consultant").

3.0 TERM AND SCHEDULE

The Working Group shall be convened from August, 2018 – May, 2019. Working Group meetings will be conducted monthly. The actual schedule for each Working Group meeting is published on the MEDSIS Working Group Portal at dcgridmod.com.

4.0 RESPONSIBILITIES AND DUTIES

By participating in the MEDSIS Working Group process, Group members agree to attend Group meetings, either in person or remotely. Group members agree to offer their perspectives and input during meetings and to respectfully consider and evaluate the input of other Group members. The Group will collectively review interim and final work products, when requested by Consultant, in accordance with the agreed upon schedule for completing those reviews.

The Group may also identify key resources that are needed to execute its tasks, including but not limited to: volunteer resources from its members and any additional paid technical resources requested along with ideas to cover the cost.

The Group shall produce the deliverables identified in Section 7.0.

The Group shall maintain a posting of its draft work products for Group member use only on the MEDSIS Working Group Workspace at https://members.sgip.org/higherlogic/ws/groups/MEDSIS_WG-3. All interim or draft documents developed by the group as well as all relevant stakeholder correspondence will be captured on this Workspace.

The Group shall maintain a posting of its finalized agendas, meeting minutes, interim and final deliverables on the MEDSIS Working Group Portal which will be accessible for all members of the public at dcgridmod.com.

5.0 KEY QUESTIONS TO ADDRESS

The Working Group will attempt to answer key questions that, if answered, would allow the Group to make recommendations to the Commission regarding Rate Design in the District that are consistent with the MEDSIS vision.

Therefore the Key Questions the Group will attempt to answer are as follows:

1. What alternative rate designs can be used to achieve the MEDSIS vision?
    - What are the pros and cons of each?
    - What incremental steps can be taken to progress towards the vision?
    - Should rate structures and designs differ among rate classes?
2. How can alternative rate designs and regulatory models align the utility's business model with the MEDSIS vision while allowing the utility to maintain financial health and also promote cost savings?
    - How can cost savings for customers be aligned with utility earnings (win-win)?
    - What mechanisms would work best in the District?
    - How can rates drive utility behavior and MEDSIS objectives?
3. How can existing programs, incentives and tariffs be coordinated to maximize the locational benefits and minimize the costs of DERs? What role does rate structure & regulation have in maximizing benefits and minimizing costs?

6.0 DESIRED OUTCOMES

The Working Group will conclude activities in May 2019. Prior to the end of May 2019, the Group may submit interim products but, at a minimum, will submit a final report to the Commission outlining its recommendations on how options for alternative rate structures and designs can occur in the District in a manner that is consistent with the MEDSIS vision.

The Group's Desired Outcomes from the Working Group process are:

1. Alternative regulation and rate designs identified that advance the MEDSIS vision

- Safe, reliable and affordable electricity for all
- Cleaner electricity
- Integrating and connecting economically efficient DERs and devices
- System utilization optimization

2. Rate Design contribution to the MEDSIS road map for DER integration and a sustainable energy delivery system

7.0 DELIVERABLES

The primary deliverable from the Group will be a final Working Group report to the Commission. The report will make recommendations on how Rate Design can occur in the District consistent with the MEDSIS vision. This report will be delivered to the Commission by the end of May, 2019.

The Working Group Consultant shall develop and publish agendas prior to each Working Group meeting as well as meeting minutes after every meeting. Additional artifacts, documents, presentations, reports, etc. as deemed relevant for the Group to complete its tasks may be produced by Consultant or Group members as mutually agreed upon by the Group members.

WG4: CUSTOMER IMPACT

1.0 PURPOSE AND SCOPE

The primary function of the Customer Impact working group (the "Group") is to assist the District of Columbia Public Service Commission (the "Commission") in fulfillment of its MEDSIS Vision Statement. This Charter shall govern the composition, leadership, responsibilities, and duties of this Group.

The Scope/ Description of the Customer Impact Working Group is follows:

The Customer Impact Working Group will address how grid modernization efforts impact various customers. Topics will include: customer equity, utility customer service, customer data protection and privacy, adequate customer protections, and low- and limited-income customer inclusion. The Customer Impact Working Group will produce regulatory recommendations aimed at ensuring that all customers benefit from the Commission's energy distribution system modernization effort.

2.0 COMPOSITION

The Working Group shall be comprised of interested parties, stakeholders, and participants of the MEDSIS Initiative. The group is open to any member of the public who would like to participate and accepts registrants on a rolling basis. Participants are required to first register on the MEDSIS Working Group Portal at dcgridmod.com in order to get access to relevant materials and meeting notices.

The Group's meetings and activities will be facilitated by SEPA Power ("Consultant").

3.0 TERM AND SCHEDULE

The Working Group shall be convened from August, 2018 – May, 2019. Working Group meetings will be conducted monthly. The actual schedule for each Working Group meeting is published on the MEDSIS Working Group Portal at dcgridmod.com.

4.0 RESPONSIBILITIES AND DUTIES

By participating in the MEDSIS Working Group process, Group members agree to attend Group meetings, either in person or remotely. Group members agree to offer their perspectives and input during meetings and to respectfully consider and evaluate the input of other Group members. The Group will collectively review interim and final work products, when requested by Consultant, in accordance with the agreed upon schedule for completing those reviews.

The Group may also identify key resources that are needed to execute its tasks, including but not limited to: volunteer resources from its members and any additional paid technical resources requested along with ideas to cover the cost.

The Group shall produce the deliverables identified in Section 7.0.

The Group shall maintain a posting of its draft work products for Group member use only on the MEDSIS Working Group Workspace at https://members.sgip.org/higherlogic/ws/groups/MEDSIS_WG-3. All interim or draft

documents developed by the group as well as all relevant stakeholder correspondence will be captured on this Workspace.

The Group shall maintain a posting of its finalized agendas, meeting minutes, interim and final deliverables on the MEDSIS Working Group Portal which will be accessible for all members of the public at dcgridmod.com.

5.0 KEY QUESTIONS TO ADDRESS

The Working Group will attempt to answer key questions that, if answered, would allow the Group to make recommendations to the Commission regarding Customer Impacts in the District that are consistent with the MEDSIS vision.

Therefore the Key Questions the Group will attempt to answer are as follows:

1. How can the MEDSIS vision be achieved at a reasonable cost in an equitable fashion across all customer classes and end users?
2. What information or tools are needed to enable all consumers to make smart energy choices and lower their costs?
3. How can MEDSIS enable more services to customers and allow customers and end users to create and derive value from the grid?
4. How can DERs result in value across all customer classes, including low and limited income customers?
5. How will customer and system data protection and privacy be ensured while consistent with the MEDSIS vision?
    - Who will have access to customer data?
    - What enforcement mechanisms exist or need to be developed to ensure data is properly protected?
6. How are low and limited-income customers defined and are there other sensitive customer groups that need to be considered?

6.0 DESIRED OUTCOMES

Upon conclusion of the Working Group activities in May, 2019, the Group will submit a report to the Commission outlining its recommendations on how Customer Impacts in the District can be addressed in a manner that is consistent with the MEDSIS vision.

The Group's Desired Outcomes from the Working Group process are:

1. Principles for achieving the MEDSIS vision at a reasonable cost and in an equitable fashion across all customer classes
2. A framework and criteria for evaluating costs and benefits to customers of implementing the MEDSIS vision

3. Recommended revisions to the Consumer Bill of Rights or other Commission regulations to advance the MEDSIS vision while maintaining customer protections
4. Identified methods to ensure customer engagement and availability of data across all customer groups
    - Recommendations on how to ensure protection of sensitive data while still advancing the MEDSIS vision

7.0 DELIVERABLES

The primary deliverable from the Group will be a final Working Group report to the Commission. The report will make recommendations on how Customer Impacts, both positive and negative, in the District can be addressed consistent with the MEDSIS vision. This report will be delivered to the Commission by the end of May, 2019.

The Working Group Consultant shall develop and publish agendas prior to each Working Group meeting as well as meeting minutes after every meeting. Additional artifacts, documents, presentations, reports, etc. as deemed relevant for the Group to complete its tasks may be produced by Consultant or Group members as mutually agreed upon by the Group members.

WG5: MICROGRIDS

1.0 PURPOSE AND SCOPE

The primary function of the Microgrid working group (the "Group") is to assist the District of Columbia Public Service Commission (the "Commission") in fulfillment of its MEDSIS Vision Statement. This Charter shall govern the composition, leadership, responsibilities, and duties of this Group.

The Scope/ Description of the Microgrids Working Group is follows:

The Microgrid Working Group will address microgrid development in the District, including newly constructed microgrids and retrofitted microgrids. This group will examine the benefits and costs of microgrids, including factors such as safety, reliability and resiliency. The Microgrid Working Group will produce recommendations to address key questions raised in Section V.C. of the MEDSIS Staff Report regarding microgrid ownership, operation, standards, and implementation. In particular, this group will investigate if current regulations are adequate and appropriate to regulate the construction, operation, and maintenance of new and existing microgrid facilities.

2.0 COMPOSITION

The Working Group shall be comprised of interested parties, stakeholders, and participants of the MEDSIS Initiative. The group is open to any member of the public who would like to participate and accepts registrants on a rolling basis. Participants are required to first register on the MEDSIS Working Group Portal at dcgridmod.com in order to get access to relevant materials and meeting notices.

The Group's meetings and activities will be facilitated by SEPA Power ("Consultant").

3.0 TERM AND SCHEDULE

The Working Group shall be convened from August, 2018 – May, 2019. Working Group meetings will be conducted monthly. The actual schedule for each Working Group meeting is published on the dcgridmod.com website.

4.0 RESPONSIBILITIES AND DUTIES

By participating in the MEDSIS Working Group process, Group members agree to attend Group meetings, either in person or remotely. Group members agree to offer their perspectives and input during meetings and to respectfully consider and evaluate the input of other Group members. The Group will collectively review interim and final work products, when requested by Consultant, in accordance with the agreed upon schedule for completing those reviews.

The Group may also identify key resources that are needed to execute its tasks, including but not limited to: volunteer resources from its members and any additional paid technical resources requested along with ideas to cover the cost.

The Group shall produce the deliverables identified in Section 7.0.

The Group shall maintain a posting of its draft work products for Group member use only on the MEDSIS Working Group Workspace https://members.sgip.org/higherlogic/ws/groups/MEDSIS_WG-5. All interim or draft documents developed by the group as well as all relevant stakeholder correspondence will be captured on this Workspace.

The Group shall maintain a posting of its finalized agendas, meeting minutes, interim and final deliverables on the MEDSIS Working Group Portal which will be accessible for all members of the public at dcgridmod.com.

5.0 KEY QUESTIONS TO ADDRESS

The Working Group will attempt to answer key questions that, if answered, would allow the Group to make recommendations to the Commission regarding Microgrids operations in the District that are consistent with the MEDSIS vision.

Therefore the Key Questions the Group will attempt to answer are as follows:

1. How are costs for microgrid projects recovered? What are the different business & institutional models that need to be put in place to address proper microgrid compensation and cost recovery?
2. What types of entities should be allowed to own and operate microgrids?
    - What are the different types of ways utilities are able to engage in microgrid projects in the District.
3. What are the allowable microgrid ownership and operational structures under the Commission's current regulations?
4. How can the Commission improve on its current regulations to ensure that future microgrid projects achieve the MEDSIS vision?
    - Should a light touch regulatory framework be considered?
5. How can microgrids further enable customer choice in the District?

6.0 Desired Outcomes

Upon conclusion of the Working Group activities in May, 2019, the Group will submit a report to the Commission outlining its recommendations on how microgrid development can occur in the District in a manner that is consistent with the MEDSIS vision.

The Group's Desired Outcomes from the Working Group process are:

1. A taxonomy that classifies the different types of microgrid applications and business use-cases.
2. A recommended plan to identify existing and proposed microgrid projects in the District.

3. Determination on the adequacy of the Commission's current microgrid regulations to meet the MEDSIS vision and make recommendations for improvements, as needed.
    - Policy and regulatory recommendations should address allowable microgrid ownership and operation structures in the District.
4. Recommendations on how services or impacts related to microgrid functionalities can be compensated.

7.0 DELIVERABLES

The primary deliverable from the Group will be a final Working Group report to the Commission. The report will make recommendations on how microgrid development can occur in the District consistent with the MEDSIS vision. This report will be delivered to the Commission by the end of May, 2019.

The Working Group Consultant shall develop and publish agendas prior to each Working Group meeting as well as meeting minutes after every meeting. Additional artifacts, documents, presentations, reports, etc. as deemed relevant for the Group to complete its tasks may be produced by Consultant or Group members as mutually agreed upon by the Group members.

WG6: PILOT PROJECTS

1.0 PURPOSE AND SCOPE

The primary function of the Pilot Projects working group (the "Group") is to assist the District of Columbia Public Service Commission (the "Commission") in fulfillment of its MEDSIS Vision Statement. This Charter shall govern the composition, leadership, responsibilities, and duties of this Group.

The Scope/ Description of the Pilot Projects Working Group is as follows:

In the MEDSIS Staff Report released in 2017, the Commission's Staff proposed an initial framework and parameters to be used to evaluate pilot project proposals. The Pilot Projects Working Group will make recommendations on the final framework and parameters regarding pilot project governance, selection, and management. The Pilot Project Working Group will not produce actual pilot project concepts or proposals. In particular, the group will address how pilot projects will be selected, monitored, and evaluated for success.

2.0 COMPOSITION

The Working Group shall be comprised of interested parties, stakeholders, and participants of the MEDSIS Initiative. The Group is open to any member of the public who would like to participate and accepts registrants on a rolling basis. Participants are required to first register on the MEDSIS Working Group Portal at dcgridmod.com in order to get access to relevant materials and meeting notices.

The Group's meetings and activities will be facilitated by SEPA Power ("Consultant").

3.0 TERM AND SCHEDULE

The Group shall be convened from October, 2018 – May, 2019. Working Group meetings will start in October and meet monthly through the entirety of the working group process. The actual schedule for each Working Group meeting is published on the dcgridmod.com website.

4.0 RESPONSIBILITIES AND DUTIES

By participating in the MEDSIS Working Group process, Group members agree to attend Group meetings, either in person or remotely. Group members agree to offer their perspectives and input during meetings and to respectfully consider and evaluate the input of other Group members. The Group will collectively review interim and final work products, when requested by Consultant, in accordance with the agreed upon schedule for completing those reviews.

The Group may also identify key resources that are needed to execute its tasks, including but not limited to: volunteer resources from its members and any additional paid technical resources requested along with ideas to cover the cost.

The Group shall produce the deliverables identified in Section 7.0.

The Group shall maintain a posting of its draft work products for Group member use only on the MEDSIS Working Group Workspace https://members.sgip.org/higherlogic/ws/groups/MEDSIS_WG-6. All interim or draft documents developed by the Group as well as all relevant stakeholder correspondence will be captured on this Workspace.

The Group shall maintain a posting of its finalized agendas, meeting minutes, interim and final deliverables on the MEDSIS Working Group Portal which will be accessible for all members of the public at dcgridmod.com.

5.0 KEY QUESTIONS TO ADDRESS

The Working Group will attempt to answer key questions that, if answered, would allow the Group to develop a set of recommendations to the Commission regarding the selection, monitoring, and evaluation criteria for pilot projects consistent with the MEDSIS vision.

Therefore the Key Questions the Group will attempt to answer are as follows:

1. What is the governance model for MEDSIS Pilot Projects?
    - Who are the stakeholders and what are their roles?
    - What is the process for pilot selection, ongoing monitoring and post pilot evaluation of results?
    - What are the reporting requirements throughout?
2. What should the selection criteria (e.g., cost recovery, cost-effectiveness, EM&V criteria, additional funding, etc.) be for proposed MEDSIS pilot projects?
3. How should proposed MEDSIS pilot projects be screened to ensure they can be reasonably executed (i.e. qualifications, project experience, resume, etc.).
4. What is the method for monitoring on-going MEDSIS pilot projects to ensure full transparency between all stakeholders?
5. What is the method for evaluating the outcome of MEDSIS pilot projects?
6. Should pilot projects be selected, monitored, and evaluated differently depending on the type and/ or duration of the pilot project (e.g., rate design pilot vs. a microgrid project, scalability, replicability)

6.0 DESIRED OUTCOMES

Upon conclusion of the Working Group activities in May, 2019, the Group will submit a report to the Commission outlining its recommendations regarding the selection, monitoring, and evaluation criteria for pilot projects consistent with the MEDSIS vision.

The Group's Desired Outcomes from the Working Group process are:

1. Recommendations on the governance model for MEDSIS pilot project selection, ongoing monitoring and post pilot evaluation of outcomes.

2. Recommendations for a standardized request for proposal (RFP) and pilot project scoring methodology
    1. What qualifies, who qualifies, etc.
    2. Should there be specific exclusion criteria? (i.e. Commission has stated in the Staff Report that unproven technologies, EE technologies and project led by unregulated subsidiaries of utilities should be excluded in MEDSIS pilot projects)
3. Recommendations for monitoring and reporting on-going MEDSIS pilot projects
4. Recommendations for evaluating MEDSIS pilot project outcomes

7.0 DELIVERABLES

The primary deliverable from the Group will be a final Working Group report to the Commission. The report will include the recommendations to the Commission regarding the selection, monitoring, and evaluation criteria for pilot projects consistent with the MEDSIS vision. This report will be delivered to the Commission by the end of May, 2019.

The Working Group Consultant shall develop and publish agendas prior to each Working Group meeting as well as meeting minutes after every meeting. Additional artifacts, documents, presentations, reports, etc. as deemed relevant for the Group to complete its tasks may be produced by Consultant or Group members as mutually agreed upon by the Group members.

The final versions of all deliverables will be posted on the MEDSIS Working Group Portal at dcgridmod.com once approved by the Group members.

A.5 - Summary of Information from Industry

Throughout the MEDSIS working group process, especially during the initial meetings, guest speakers and subject matter experts from industry were invited by SEPA to educate stakeholders. Likewise, SEPA conducted exhaustive research on topics of interest to the working group via industry research, consultant reports, SEPA research, news articles, etc. for stakeholder review and discussion.

As a result of this process, many lessons learned were gathered from information presented to or created by the working groups and a great deal of industry information was disseminated to the various stakeholders. In some cases this information influenced the development of the "Recommendations and Learnings" documented in Chapter 5 of this report. This appendix documents information shared in the working group meetings and should be considered a resource the DSPCS can reference in the future.

The information below is organized by working group.

WG 1: DATA AND INFORMATION ACCESS AND ALIGNMENT

August 2018 Mtg:

The August DIAA working group meeting's primary focus was on developing a working group charter. During the meeting working group members determined the key questions and desired outcomes they would like to accomplish through the MEDSIS working group process and developed the DIAA working group charter. It was also determined during this meeting that the working group would split their key questions and desired outcome into two categories; one addressing grid modernization strategy and common framework and the other addressing data information availability and accountability.

September 2018 Mtg:

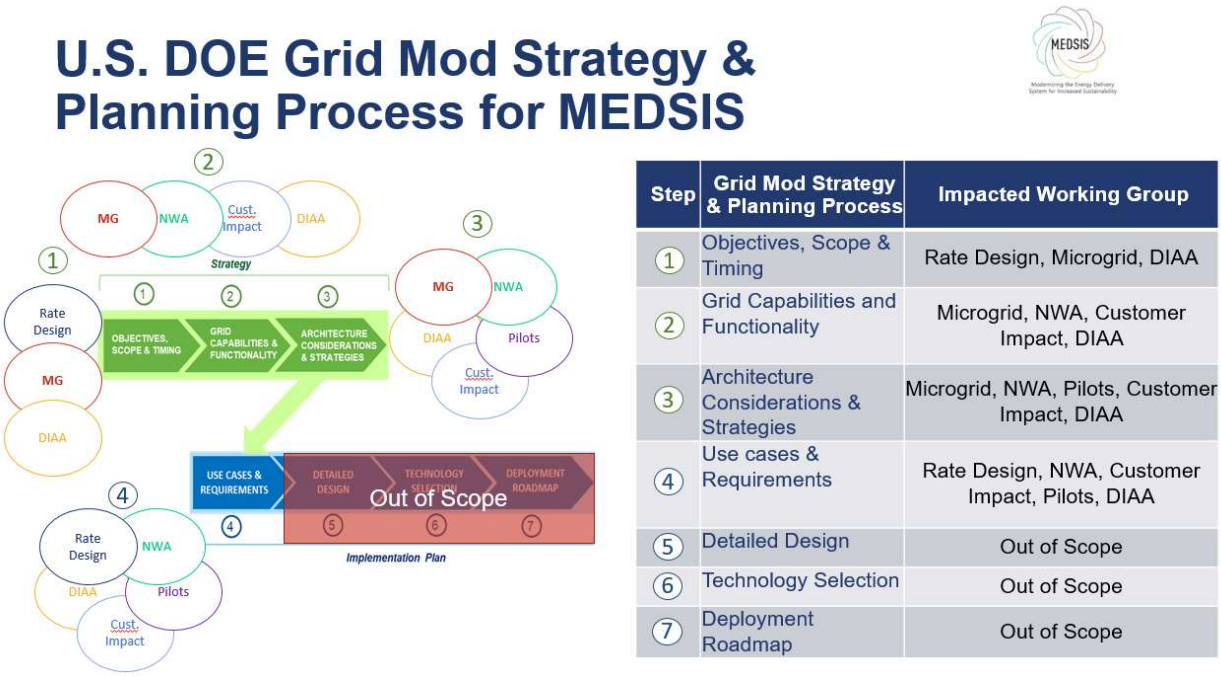
In September, DIAA working group members covered two important topics that lead to addressing multiple key questions in the working group's Charter:

1. Mapping out grid modernization for the MEDSIS working groups
2. Assigning measurable objectives to the MEDSIS Guiding principles

At the beginning of the meeting MEDSIS Consultant provided an overview of other grid modernization efforts' roadmaps and stakeholder completed an exercise identifying what a roadmap meant to them.

Joe Paladino from the U.S. Department of Energy (DOE) then presented on grid modernization strategies and planning process from which working group members

adopted the U.S. DOE grid modernization chevron map[54] to be developed further for the MEDSIS initiative.



Step	Grid Mod Strategy & Planning Process	Impacted Working Group
1	Objectives, Scope & Timing	Rate Design, Microgrid, DIAA
2	Grid Capabilities and Functionality	Microgrid, NWA, Customer Impact, DIAA
3	Architecture Considerations & Strategies	Microgrid, NWA, Pilots, Customer Impact, DIAA
4	Use cases & Requirements	Rate Design, NWA, Customer Impact, Pilots, DIAA
5	Detailed Design	Out of Scope
6	Technology Selection	Out of Scope
7	Deployment Roadmap	Out of Scope

Lastly, during this meeting the District of Columbia Department of Energy and the Environment (DOEE) proposed there be measurable objectives assigned to each of the MEDSIS Guiding Principles and provided examples in a spreadsheet they created. It was determined that other working group members should also complete this exercise.

October 2018 Mtg:

In October, DIAA working group members mapped the six MEDSIS working groups to the DOE grid modernization chevron map and refined responses to the activity assigned in the previous meeting of assigning measurable objectives to the MEDSIS guiding principles. During this meeting, working group members determined that MEDSIS working groups touched on multiple steps of the grid modernization planning process and that steps 5-7 of this process (use cases & requirement, detailed design, technology selection, and deployment roadmap) were out of scope for the MEDSIS working group. Participants also assigned measurable objectives to the first three MEDSIS Guiding Principles (well-planned, safe & reliable, and secure).

[54] U.S. DOE's Presentation on "Considerations for Grid Modernization": https://dcgridmod.com/wp-content/uploads/2018/10/MEDSIS-WG1-DIAA-U.S.-DOE-Presentation_092118.pdf

November 2018 Mtg:

In advance of the November DIAA working group meeting, pre-read materials were sent to working group members on the PEER rating system[55] as a potential way to score the measurable objectives assigned to the MEDSIS Guiding Principles.

During the November meeting, DIAA working group members completed assigning measurable objectives to the MEDSIS Guiding Principles not covered in the previous meeting (affordable, sustainable, interactive, and non-discriminatory).

In this meeting, the MEDSIS Consultants reminded the working group that one of its function is to monitor ongoing cases and weave in information from interrelated cases as necessary. The following cases were discussed:

1. EV filing within FC1130 - The group discussed that it is currently in comment period and ongoing. The group will review the happenings from this case in January.
2. FC1149 Order No. 19471 - The group discussed the implications of this case and order on the senior community. The facilitators will monitor this case and introduce it to the Customer Impact working group.
3. FC1050 - This interconnection docket is going through its third NOPR. Once the final ruling is made, the facilitators will weave it into the NWA, Microgrid and Customer Impact working groups.
4. FC1150 - Rate case docket is considering Performance Based Regulation and Multi-year Rate Plans. It will be monitored in both this working group and the Rate Design working group. The deadline of this case is May '19.
5. FC1144 and FC1153 - These are two ongoing cases that the Commission has directed the working group to not discuss. These ongoing cases shall not be brought into the conversations we are having in the working group meetings. However, the results and recommendations coming out of the working group meetings may be used to help inform the Commission on making future decisions regarding grid modernization.

At this point, having addressed the key questions in the working group charter around grid modernization strategy and establishing a common framework, the DIAA working group began to address the second half of their working group charter around system-level data availability and accessibility.

[55] http://peer.gbci.org/sites/default/files/resources/PEER-v2-Rating-System.pdf

December 2018 Mtg:

DIAA group did not meet by design.

January 2019 Mtg:

In between the November and January working group meetings, working group members were sent a survey to gather their perspectives on accessing and sharing system-level data. The following working group members responded to the survey:

- Pepco Holdings Inc.
- D.C. Consumer Utility Board (DC Cub)
- D.C. Department of Energy and Environment (DOEE)
- D.C. Office of the People's Counsel (OPC)
- Edison Electric Institute (EEI)
- D.C. Climate Action (DCCA)
- D.C. Sustainable Energy Utility (DCSEU)
- Grid2.0
- Institute for Market Transformation (IMT)

The main focus for the January DIAA working group meeting was to level set on the current state of system-level data in the District and discuss system-level data needs.

During the meeting, DIAA working group members heard from Alex Dinkel, Senior Power Systems Engineer, Grid Unity, on what goes into system level planning and data sharing. Grid Unity mentioned the following:

- There is a general industry trend going on of increased data sharing
- Utilities are moving towards sharing more data because there is a business benefit and they recognize the wave of change in how they engage with their customers
- If analysis on the system-level data is being done and included in a locational constraint report or hosting capacity map there is no need to make the sensitive information that goes into those documents available to the public

Nikhil Balakumar, Principle, Greentel Group, also presented to the working group on "A Data-Driven Roadmap to Accelerate Grid Modernization on Keys to Success/Building Blocks." Nikhil shared:

- Two keys to success for grid modernization are visibility into the grid and market access
    - Visibility is to identify opportunities where DERs can be integrated and provide the maximum value to the grid

- Market Access is to participate in markets where DERs can meet capacity needs and provide services to the grid

The final presentation in this meeting was from Mischel Kwon, Founder and CEO, MKA Cyber, about illustrative cyber security best practices to frame discussion, including:

- Understanding there are a wide range of adversaries - some want to harm the country, some want to harm companies and some want to harm specific customers.
- Conversations around fairness of distribution of data are not security questions.
- Cyber security can be used to protect against hackers and be used to protect company's intellectual property.
- A proper vetting process and screening process should be exercised between all groups who begin to work with each other. For example, non-disclosure agreement and background check during bidding process.
- Exercise a secure portal or encrypted vehicle/avenue for sharing information.
- If a high security threshold is established that people are comfortable with, sharing information becomes easier.

At the end of the meeting it was determined that to further the discussion on system-level data access and availability participants would have to identify specific types of system-level data requests and the intended use for each requested data point.

February 2019 Mtg:

DIAA did not meet by design.

March 2019 Mtg:

In between the January and March DIAA working group meetings, several working group members responded to the request for specific system-level requests and justifications. Participants who responded include:

- Sunrun
- Pepco
- Coalition for a Resilient DC (CRDC)
- D.C. Office of the People's Counsel (OPC)
- D.C. Climate Action (DCCA)
- D.C. Department of Energy and Environment (DOEE)
- Independent Stakeholder (Torrey Beek)

During the March DIAA working group meeting, stakeholders reviewed the results from the system-level data access and justification activity. In response to the requests,

Pepco conducted an extensive information pull internally to assess, of the requested data, what was already supplied data, what data could potentially be made available under certain circumstances, and what data could not be made available and why.

Pepco noted that their approach when assessing whether the data requested could be made available was to, “strive for yes and if not answer why not.” Additionally, Pepco explained that there are currently data requests submitted to them by for profit companies that are being paid for by rate payers.

Below is a summary of the information Pepco found in response to the system-level data requests and justification activity:

Already Supplied Data:

1. Forecast Demand Growth: Located in ACR to substation level
2. Customer Type: Proportion of customers is provided in Bill Stab. Adj. report
3. Outage Data: Provided monthly; SAIDI/SAIFI and planned load transfers provided in ACR
4. Downloadable Data: Provided through online CEO portal on Pepco website with Green Button Download My Data* (*WG ID’ed problem with downloading and viewing data in accessible format/view* CSV must be exported to excel. Clarify that it is raw data.)
5. Pepco Contribution to PJM Coincident Peak: Monthly zonal load is provided in the ACR

Ongoing: Pepco is streamlining ACR with Staff input

6. DER Integration Software / ADMS: Reported in ACR and rate cases (consolidated in Construction Reports)
7. Hosting Capacity by Feeder/Circuit: Hosting Capacity Maps
8. Avg. Load as a % of Hosting Capacity: Hosting Capacity Maps and Heat Maps
9. DER as a % of Hosting Capacity by Feeder/Circuit: Hosting Capacity Maps and Heat Maps
10. Hosting Capacity Methodology: Stochastic Method
11. Interconnection Queue and Interconnection Associated Costs for DER Projects: Supplied to interconnection applicants

Duration/Size/Seanonality of constraints included in LCR (different from Value of DER / grid study)

Data Not Currently Available:

1. DER Services Performance (called-on DER): "Pepco does not yet have called on DER in D.C." Info will be collected on all future NWA projects. – Not currently available
2. Locational Value and Network Value: "Interferes with a competitive solicitation process" (WG3 Value of DER/grid study recommendation) – undercuts bidding process because you can no longer differentiate on price (potentially anti-competitive practices)
3. Carbon Intensity of Electricity Provided by PJM: Available to PJM and Electric Supplier Data (WG1 ID'ed problem with Electricity Supplier Fuel Mix Reporting)
4. Hourly Load Profiles for Each Substation Service Area: Data could be made available but analysis is needed (unsure whether Pepco can share…a secured portal necessary for a data request like this / unsure whether Pepco can be responsive – will explore this more)
5. Customer Class in Each Substation: "Customer class data is not maintained by substation". Data could be made available but cost impact on ratepayer.
6. Fall/Spring Load Profiles During Active Hours of Solar Generation: "This data could be made available but cost impact on ratepayers"
7. Hourly profile of DER supply and power load per month by feeder/circuit: DER provider could provide information in Load Impact RFI – (Pepco may be required to guarantee DER providers who give information that it will kept confidential)

Look at NY secure-gates for NWA portal

8. Voltage and Power Quality Issues: "Individual customer issues cannot be shared without customer consent"
9. Peak Hour and Capacity Utilized During Peak Hour per Month for each substation and major feeder groups*: Locational Constraints Report (LCR) will include data for the areas identified as having a constraint. Data could be shared with RFP under NDA
10. Network Demand Data*: Legally must be aggregated to 5+ customers. All DC circuits have security concerns and would require NDA in an RFP process through secure platform.
11. Network Sizing (rated capacity)*: LCR will reflect NWA capacity need. Data could be shared with RFP under NDA.
12. Anonymized and aggregated load and demand data by circuit and transformer, and capacity limits*: LCR and RFP/NDA.
13. Geographic Awareness: Subject to NDA

WG 2: NON-WIRES ALTERNATIVES TO GRID INVESTMENTS

August 2018 Mtg:

NWA working group did not begin until October

September 2018 Mtg:

NWA working group did not begin until October

October 2018 Mtg:

This was the first meeting of the working group and time was spent establishing the charter and key questions and outcomes as defined by the stakeholders participating in this group. In this first meeting, the group decided a definition of NWA was needed.

November 2018 Mtg:

In the November 2018 working group meeting, WG2 heard from Erik Gilbert, Navigant Research, on "Non-Wires Alternatives (NWA) Overview." Highlights include:

- Business and Procurement Models

- At this early stage in NWA development, there is no standard business model or procurement process for utilities to implement NWA
- Currently, there are various procurement models being considered and tried
  - Internal utility resource deployment
  - Procurement with current program implementation contractors
  - Request for Proposal (RFP)
  - Auction
- The NY JU suggested Pricing, Program and Procurement (the 3Ps) as a way to look at how NWAs are acquired
- There is no one right answer for all situations; each case will depend on the utility's internal structure and capabilities and its regulatory environment.

DOEE asked why New York was moving away from LSRV. Presenter replied that New York hasn't backed off on establishing locational value, but one proposed mechanism (LSRV) became controversial enough amongst stakeholders that it was pulled out of consideration. Navigant responded that it's an example of the challenges of such a new area--establishing a price is a non-trivial item.

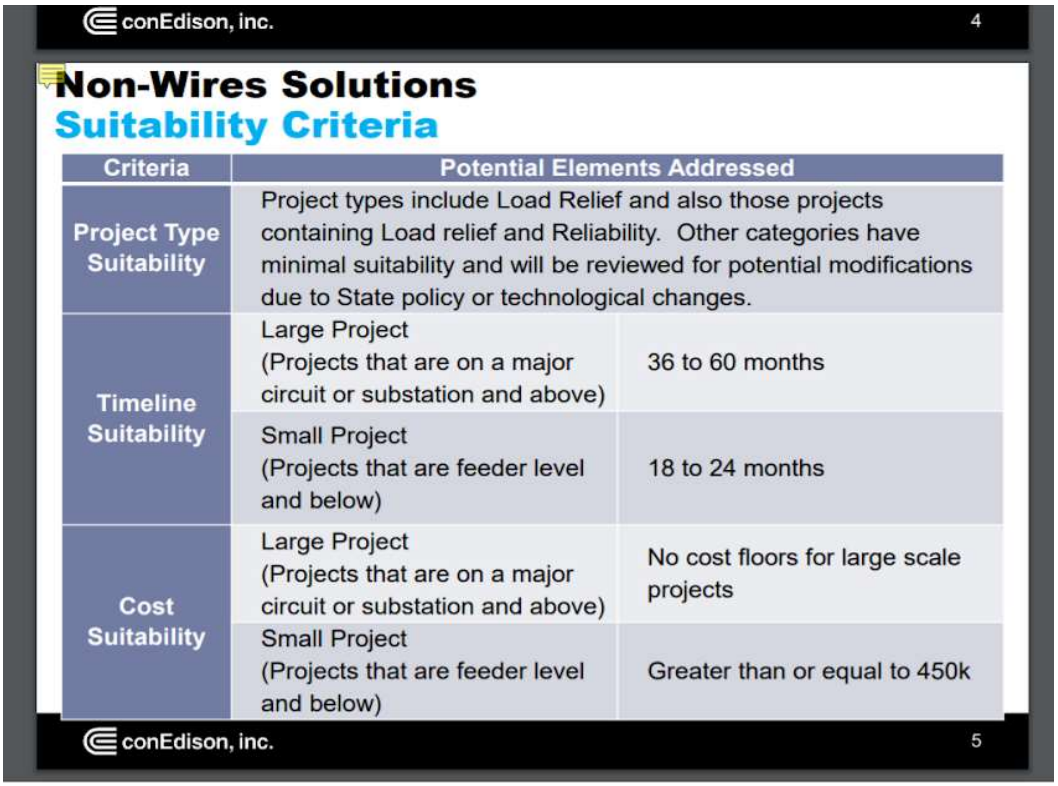
DC Climate Action asked how New York was evaluating risk for NWA and reliability. Presenter replied that risk is valued at different points. One place is during suitability process, another place is when the utility goes out to bid for NWA solutions. The utility evaluates risk as part of that process. They then set up contracts with teeth in them to address risk – similar to EE program contract where there's a penalty when EE targets are not hit.

The remainder of the meeting was discussion on the draft NWA strawman definition supplied by SEPA.

December 2018 Mtg:

In the December 2018 working group meeting, WG2 heard from Balvinder Deonarine, Project Manager, ConEdison on "ConEdison's Non-Wires Solutions, including non-wires suitability criteria and on the Brooklyn Queens Demand Management (BQDM) project:

Non-wires Suitability Criteria



Credit: ConEdison

- Brooklyn Queens Demand Management (BQDM) Project
- Deferral of $1.2 billion in traditional network upgrades with distributed solutions
- Meets capacity shortfall through a $200 million program
- Non-traditional customer-sided 41 MW ($150 m)
- Utility-sided solutions 11 MW ($50 m)
- 78 responses to RFI
- Expenditures treated as 10 year capital assets with regulated return

Also in the December 2018 working group meeting, WG2 heard from Brenda Chew, SEPA, on three NWA case studies:

APS - Punkin Center

Description: APS was faced with the traditional option of rebuilding 17 miles of distribution lines over rough terrain to address load growth and consequent thermal constraints on the feeder. After reviewing the growing community's needs, APS determined that adding battery storage could address the problem at a lower cost. The utility deployed a 2 MW, 8 megawatt-hour (MWh) battery system that has been in daily operation since March 2018.

Challenge/Opportunity: Rural location with difficult geography and thermal conditions in both summer and winter.

Sourcing: Direct procurement through competitive-bidding process

Technology, Size, and Location: Electric storage/2 MW/8 MWh/Punkin Center, Arizona (about 90 minutes Northeast of Phoenix

Drivers: Thermal constraint on distribution feeder and economic benefit for APS customers

Outcomes: Successfully provided reliable peak shaving service on the thermally constrained feeder during the summer of 2018. Project proved to be a cost-effective solution for APS to serve the rural community, compared to reconductoring of the line (2X cost of NWA). The battery project is designed with the capability to add energy capacity as the need arises over the next five to 10 years. 4 use cases of NWA: load service, voltage regulation, frequency response and peak shaving.

National Grid - Old Forge

Description: National Grid's Old Forge project is currently still in development. It seeks to improve the reliability on a radial, 46 kV sub-transmission line that feeds five substations in three New York counties. National Grid issued an RFP in early 2017 that was open to all vendors and DER technologies. Eight out of nine proposals included a BESS technology. The utility is applying a BCA tool to short list proposals. A final decision is anticipated in Q1 2019.

Challenge/Opportunity: Distribution grid constraint and grid resiliency

Sourcing: Direct procurement

Technology, Size, and Location: Electric storage/19.8MW, 63.1MWh/upstate New York

Drivers: Internal management decision

Outcomes: The Old Forge project is still in the early phases of procurement. Results will be available later in the project timeline

Central Hudson - Peak Perks Targeted Demand Management

Description: Central Hudson's Peak Perks Targeted Demand Management Program was designed in conjunction with the New York Public Service Commission's REV initiative. The program seeks to defer the need for new infrastructure in three targeted zones for five to 10 years, reduce future bill pressure for customers, and create additional earnings opportunities for the utility. Through an incentive-based model, 70% of benefits go to customers through rate moderation, and 30% of benefits go to the utility as an incentive for running the program effectively.

Challenge/Opportunity: Distribution grid constraint

Sourcing: Customer Program

Technology, Size, and Location: Demand response/16 MW/New York State's Mid-Hudson River Valley

Drivers: Regulatory mandate (NY REV)

Outcomes: Exceeded the total, first-year MW target for all three zones, achieving 5.9 MW of load reduction compared to the target of 5.3 MW. Achieved its 50% load reduction milestone of 8.0 MW in October of 2017 with approximately 3,000 active devices deployed, nine large C&I customers enrolled, and a 40% adoption rate within the Fishkill area. Project included technology agnostic RFP, and included a different utility compensation model.

January 2019 Mtg:

Individual citizen stakeholder (Torrey Beek) circulated documents on hosting capacity and advanced inverters (Minnesota and EPRI reports).

In the January 2019 working group meeting, WG2 heard from Michael DeAngelo, Avangrid, on "Integrating NWA into the Planning Process," highlights including:

How States are expanding mandate of NWAs New York:

- 2016 REV Order est. NWA requirements for Distribution Planning
- Recently expanded to include Electric Transmission and Gas (Non-Pipes)
- Market to develop solution; technology agnostic
- Earnings mechanism for utility NWA payments / incr. Costs

Maine:

- Existing NTA process for siting transmission projects
- Dec 2017 NTA Coordinator Order est. utilities role to evaluate and develop NTAs
- Includes all transmission and distribution investments
- Utility ownership and operation of NWAs allowed if efficient solution; no requirement to be technology agnostic
- Incentive rate proposal filed June 22 and Oct 1

Connecticut

- Currently no NWA process requirements; though it is emerging
- Part of the scope of 2018 PURA's proceeding "PURA Investigation into Distribution System Planning of the Electric Distribution Companies"

Targeting NWAs to Types of System Needs

- Avangrid targets NWAs to certain types of system needs

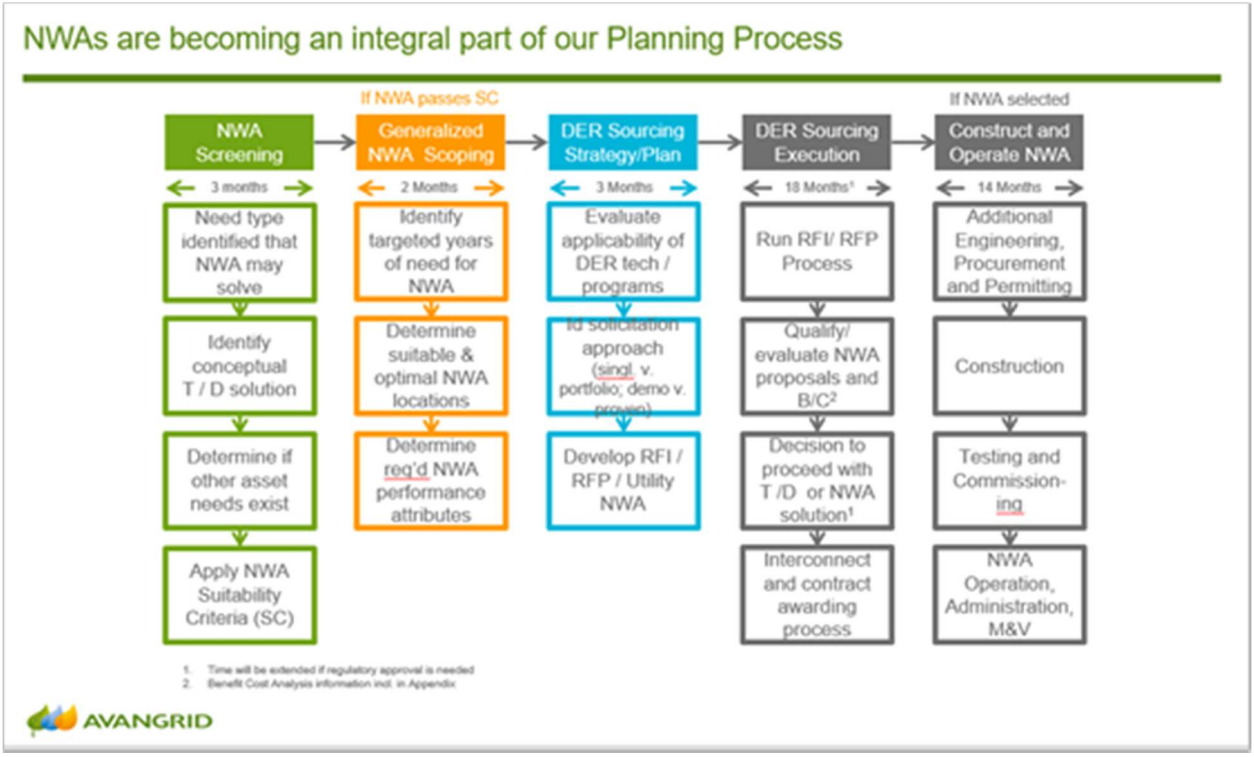
NYSEG / RG&E's NWA Suitability Criteria

- Filed with the NY PSC in 2017. Must be applied to all electric T&D projects included in the companies' capital plan, with the following criteria:
- Project Type: Load Relief projects that do not involve a customer contribution or have a specific customer in-service date that is sooner than the timeline suitability of 36 months. Reliability projects and/or a combination of reliability and load relief projects
- Timeline: Minimum of 36 months to time of need

- Cost: Projects with construction cost greater than $1,000,000

NWAs as Integral part of ConEdison Planning Process

- NWA are located under Avangrid's Integrated System Planning group, which also includes transmission and distribution planning, with the planning process as follows:



Credit: Avangrid

Keys to success for Avangrid's NWA process include:

When determining when NWA are suitable:

- Need a full understanding of what you're deferring
- Consider needs beyond the primary need driving the NWA process
- I.e., A comprehensive assessment of "wires" solution facilities may be warranted to assure accuracy of potential T&D cost deferrals

Information provided to 3rd parties:

Advanced/prior communications of planned NWA opportunities

NWA RFP information is clear and complete

Explain benefits/costs methodology

Awareness of interconnection process requirements

- Importance and accuracy of details in proposals

Contracts

- NWAs will be performing a reliability service and must be held to a different level of accountability then DERs are used to
- Negotiations can be time consuming (longer than anticipated; new process)
- Performance provisions
- Liability and risk

Involve operations and other key business areas

- Alignment of planned NWA resource operation/use
- Need for added grid visibility, automation and procedures
- Deep cross-functional technical review integrating NWA into grid operations

Lessons on Distribution Planning & NWA:

In New York and California, the distribution planning and NWA consideration process includes stakeholder engagement. In both states, the ultimate decision of choosing NWA over grid investments is up to the utilities through competitive procurement and is defended in the general rate case. In Maine, the Commission was considering a third-party Non-transmission Alternatives (NTA) coordinator and ultimately rejected the concept, while determining that the utility is best suited to be the coordinator of NTA and making planning decisions. In each of these jurisdictions where NWAs and planning processes have been evolving, the role of the Commission is to approve/reject projects during the rate case and the role of the utility is to make decisions on NWA projects. The common thread between all is increased transparency and stakeholder engagement. The level of transparency and system level data access vary jurisdiction by jurisdiction.

February 2019 Mtg:

In the February 2019 working group meeting, WG2 heard from Nitzan Goldberger, Energy Storage Association (ESA) on their organizational priorities and principles, highlights including:

- Energy storage assets are unique as they can provide Transmission, Distribution, and Generation benefits/services
- ESA member-driven working group developed principles
- Ownership of storage should be open to all stakeholders
- Ownership rules should seek to maximize value of storage
- Regulations should be updated to reflect storage's unique qualities
- Storage should be provided through a framework that promotes competition

- BTM storage merits special considerations, based on the specific jurisdiction

ESA recommends in restructured markets, energy storage assets should be enabled to provide cost-recoverable T&D and revenue-based market services. Grid-connected systems should be enabled to provide end-user services, distribution system services, and bulk system services simultaneously. In restructured markets, regulated utilities should not be restricted from owning and operating energy storage. Regulations should allow hybrid business models for utility and non-utility entities to provide distinct services in a single energy storage asset.

ESA recommends for behind-the-meter (BTM) and regulatory recommendations: identify opportunities and mechanisms for BTM energy storage (by end-use customers, 3rd-parties, utilities) to provide value to the grid. Ensure utility ownership of BTM energy storage neither precludes nor disadvantages ownership by end-use customers or 3rd parties. Consider ways to mitigate structural differences between regulated utilities and 3rd parties and customers in cost, risk, and compensation associated with BTM storage.

Energy Storage Association (ESA) worked with stakeholders in Maryland on energy storage regulatory and commercial models as part of PC44 to develop an energy storage pilot that tests multi-use and multiple ownership models, including:

- Model 1: Utility owned asset - utility bids in asset to wholesale market when not used for grid services
- Model 2: Utility owned asset leased to third party - used for retail applications when not used for grid services
- Model 3: Third party owned asset - provides grid services when not used for retail or wholesale market benefits
- Model 4: Aggregation of BTM assets - provides utility grid services, when not used by the utility for retail or wholesale market benefits

Also in the February 2019 working group meeting, WG2 heard from Betty Watson, Tesla, on energy storage ownership case studies, including an overview of potential Maryland PC44 energy storage proposed ownership models and Tesla case studies:

- Utility Owned & Operated:
    - *Southern California Edison Mira Loma Substation* is a utility-owned asset, with storage used for local capacity and wholesale market service. Project size is 20 MW / 80 MWh.
    - *National Grid Nantucket* is a restructured wires-only company, located on an island served by 2 underwater transmission cables. Battery storage applications include transmission deferral (defer investment in a third cable for 20 years), in addition to supply back-up service if a current cable goes down. Project size is 6 MW / 48 MWh.
    - *PG&E Llagas Substation* energy storage applications include distribution deferral and wholesale market services. Project size is 20 MW / 80 MWh.

- Third Party Ownership & Reliability:
    - For the *Neoen Hornsdale Wind Farm* (Australia) reliability is provided via a third-party contract, with Neoen own/operating battery. The Australian government contracted with Tesla for reliability, to reserve a specific percentage of battery storage for use all day/ every day. The battery is slightly larger than required, with excess used for participation in wholesale market. Project size: 100 MW / 129 MWH.
- Virtual Power Plant
    - *Green Mountain Power (GMP)* energy storage is a virtual aggregated resource, located in homes across Vermont. Applications include back-up power, peak shaving, and reducing transmission and distribution (T&D) costs. GMP can own the battery or lease to the customer.

Also for the February meeting, SEPA provided information on DER Ownership Regulation in Other Jurisdictions

- California: In 2013, California set the first and most aggressive energy storage procurement target in the US. AB 2514 set a target of 1,325 MW (limited utility ownership of 50%) of operational storage by 2024. In 2016, AB 2868 allows 500MW to be rate-based by the three IOUs. AB 2868 allows utility ownership of behind-the-meter storage as long as it does not unreasonably limit or impair the ability of nonutility enterprises to market and deploy energy storage systems.
- New York: The New York Public Service Commission (NYPSC) adopted a regulatory policy framework making utility ownership of DERs the exception rather than the rule. The exceptions permitting utility ownership of DERs are: 1) to meet a system need; 2) DERs that are integrated into distribution system architecture; 3) involve low- or moderate-income customers; or 4) demonstrate learning from pilots.
- Maine: In February 2018, the Maine Public Utility Commission ruled to allow an exception which permits utility ownership of generation and energy storage only if the asset improves grid reliability and efficiency.
- Illinois: In February 2018, the Illinois Commerce Commission (ICC) issued a final order which approved the Bronzeville microgrid and directed third party ownership of generation coupled with ComEd ownership of the energy storage. The ICC also determined that due to the microgrid's distribution function, ComEd can recover costs via distribution formula rates.
- Massachusetts: HB 4568 defines storage as a "commercially available technology that is capable of absorbing energy, storing it for a period of time and thereafter dispatching the energy" and may be owned by a utility. The bill also modifies the definition of "generating facility" to "a plant or equipment used to produce, manufacture or otherwise generate electricity and which is not a transmission facility or an energy storage system procured by a distribution company for support in delivering energy services to end users.

- New Hampshire: HB 1647 introduced into legislation to consider energy storage.
- Texas: Public Utilities Commission of Texas has an active docket No. 48023 considering energy storage ownership and released a report to legislature asking for guidance on ownership.

Furthermore, the facilitators presented a case study of California's new distribution resource planning cycle and advisory group, established in February 2018 by the California PUC.

March 2019 Mtg:

In the March 2019 working group meeting, WG2 heard from Scott Baker, PJM. Highlights including:

- Bulk Power System Impacts of DER & Importance of Ride Through
- OLD IEEE 1547-2003 vs NEW IEEE 1547-2018
  - Requires engineering decisions about how the ride thru takes place.
  - States could choose different settings and DERs act differently across PJM
  - PJM asked for coordination on settings

Also in March, WG2 heard a proposal from Nina Dodge, DCCA. DCCA made a proposed recommendation on advanced Inverters. Pepco asked if the stakeholder engagement process would set goals for advanced inverters to deliver and schedule. Pepco highlighted their concern about the technical nature of the subject, and how you populate the stakeholder group to have the technical capacity to make recommendations. There is an important role of stakeholder education.

PJM commented that however technical you think this conversation is--double it.

DC Climate Action commented on 2 aspects: 1) what capabilities do we want our advanced inverters to have, 2) role of cost and rate-basing. We can look to Minnesota as an example.

Sunrun discussed Hawaii and California examples.

NV5 thanked DC Climate Action for bringing up this important discussion. Suggested that stakeholder working group should come up with target/goals, and then let Pepco DER engineers develop standards to align/implement targets.

Also in March, WG2 heard from Edward Yim, DOEE and Shalom Flank, Urban Ingenuity on a Proposed Recommendation for a NWA Pilot Project.

- Pick a neighborhood on a single feeder.
- Make it sectionalized so it can island. Use existing wires.
- 80% of homes with solar. Add storage.
- Potential sites:

  - Woodley Park B- but on a LV network so not an option.
  - Laurel Highlands (B+). Assume it's a radial feeder so may be an option.
  - Henson Ridge (A+) extremely limited capacity factor so prime candidate for NWA
- Storage is centrally located because want 80% penetration and want to sectionalize the feeder so makes it easier having storage centrally located.

Pepco replied it is an appropriately targeted place and they are excited to figure out how it would work as a NWA. Facilitator asked: Does this suggestion address recommendation that Grid 2.0 was requesting. Grid 2.0 replied yes, it is in the spirit of what we were requesting. Pepco commented that it seems like a good way to test NWA opportunity from a technical standpoint.

WG 3: RATE DESIGN

September 2018 Mtg:

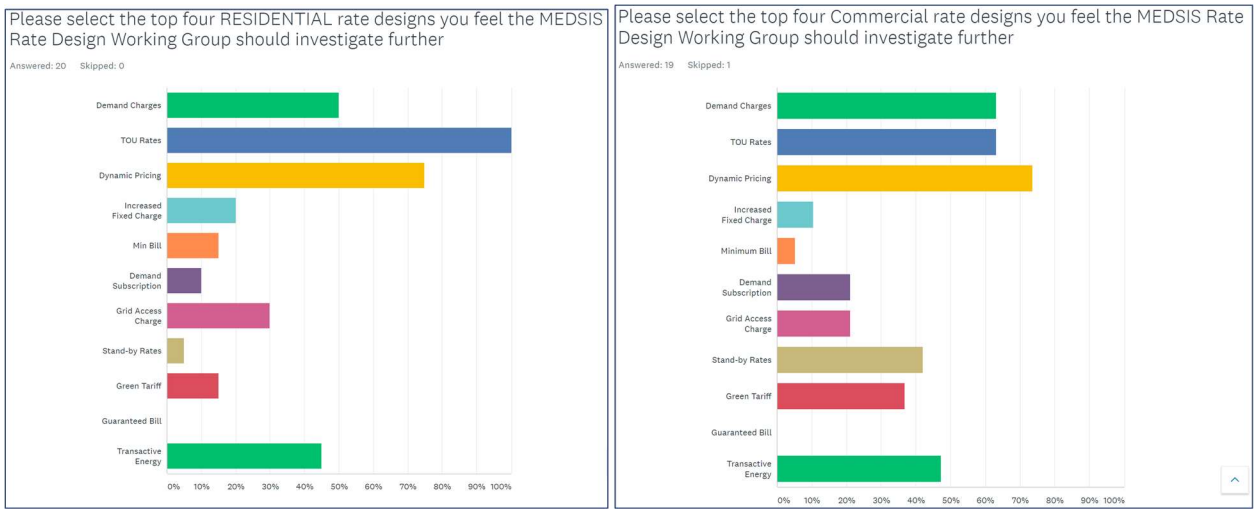
The stakeholders were provided the NARUC DER Rate Design manual: hps://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0 as reference.

In the September 2018 working group meeting, WG3 heard from Sanem Sergici, Brattle Group, on "Rate Design in a High DER Environment" including the note that rate design is an art not a science, and is a balancing act as some of the principles of rate design can work against each other:

- Cost causation: Rates should reflect cost causation, including embedded costs, long-run marginal and future costs.
- Encourage outcomes: Rates should encourage desired market and policy outcomes in a technology neutral manner.
- Policy transparency: Incentives should be explicit and transparent, and should support policy goals.
- Decision-making: Rates should encourage economically efficient and market-enabled decision-making in a technology neutral manner.
- Fair Value: Customers and utility should both be paid the fair value for the grid services they provide.
- Customer Orientation: Rates should be practical, understandable and promote choice.
- Stability of customer bills: Customer bills should be relatively stable.
- Access: Electricity should remain affordable and accessible for vulnerable sub-populations.
- Gradualism: Rate changes should be implemented in a manner which would not cause any large bill impacts.

- Economic Sustainability: Rate design should reflect a long-term approach to price signals and remain neutral to any particular technology or business cycle.
- Additionally, Sanem shared an overview of alternative rate designs, including: Demand Charges, Time of Use (TOU) rates, Dynamic Pricing, Increased Fixed Charge, Minimum Bill, Demand Subscription, Grid Access Charge, Stand-by Rates, Green Tariff, Guaranteed Bill, and Transactive Energy.

As a follow up to this presentation SEPA conducted a survey asking WG3 members about what alternative rate designs they would like to learn more about. The results of the survey are shown below in Figure.



Rate Design Survey Results

October 2018 Mtg:

At the October 2018 working group meeting, WG3 heard from David Littell, Regulatory Assistance Project (RAP) on 3 levels of performance-based regulation:

Public Metrics Only: Only establishing a metric and public reporting.

- Example: Illinois Response Times report metric. A PBR “lite” approach.

Public Metrics with Ranking: Metrics are publicized and ranked.

- Example: Denmark DSO efficiency ranking; UK RIIO.

Public Metrics with Financial Incentives: Metrics are publicly available, and utilities receive financial rewards or penalties depending on achievement of the metrics.

- Example: New York Reforming the Energy Vision (NY REV).

The working group also discussed the results of the Rate Design survey.

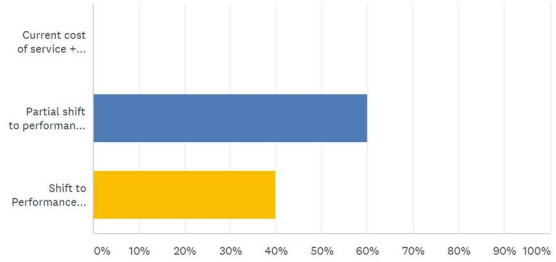
As a follow up to the RAP presentation on PBR, SEPA constructed a survey to poll WG3 members on their interest in transitioning to a PBR model in the District and to get

their perspectives on performance incentive mechanisms (PIMs) that might be applicable. The results of the survey are shown in the below Figures.

	(1) Current Cost-of-Service Model + Limited Incentives	(2) Partial Shift to Performance-based Compensation	(3) Shift to Performance-based Compensation
General Description	This alternative would maintain Minnesota's current cost-of-service regulatory framework, but add limited performance incentives for particular policy outcomes that are not incentivized by the current system. The Conservation Improvement Program incentive is an example of an existing performance incentive. Similar tools could be used to target other outcomes. For example, increased adoption of distributed energy resources was identified by e21 as another potential targeted area for performance incentives. Another example could be a return on equity band on specific types of investments, similar to the Metropolitan Emissions Reduction Project. In this alternative, utility earnings from performance are incremental to returns set in a rate case.	This alternative would be a hybrid approach of the current cost-of-service model and a performance-based framework. It would allow utility earnings to be derived from a combination of returns on capital investments and from performance outcomes. The net effect encourages utilities to achieve performance goals, but maintains a return on capital expenditures. In this alternative, the potential for performance incentives and/or penalties is addressed in a rate case.	This alternative would be a change from the current cost-of-service model to a model where utility shareholder value is based on utility performance. This framework seeks to reduce or eliminate incentive for capital expenditure as the driver of shareholder value, and instead incentivizes utilities to achieve agreed-upon outcomes using whatever means best achieves them. However, it does not seek to *disincentivize* utility capital investment, as utilities would still be allowed cost recovery for reasonable capital investments. However, to be clear, utility capital investments would not earn shareholder returns, but would recover the cost of financing. Shareholder returns would instead be earned through a combination of utilities' achieving performance goals and possible new product and service revenue opportunities. In this alternative, the potential for performance incentives and/or penalties is addressed in a rate case as part of a comprehensive package.

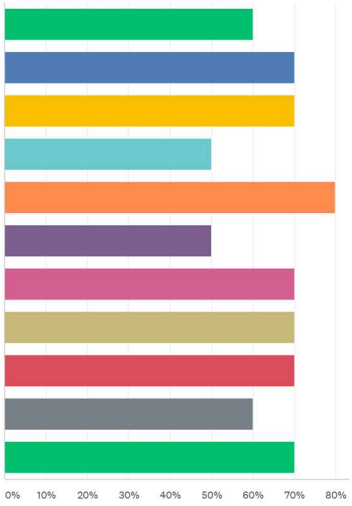
All forms of PBR in the US include elements of cost of service and some degree of performance mechanisms. Minnesota contemplated three different models of reform in moving to PBR. Using their model as a proxy (see options below) , which do you feel would be most appropriate in DC (keeping in mind, the devil is in the detail).

Answered: 10 Skipped: 0



PBR Survey Results – PBR Transition

- DER deployments are increased
- Customers and providers can use energy and usage data to make efficient decisions
- Load is managed in a way that best utilizes the existing system cost effectively thus deferring capital investment
- Reductions are achieved in pollution and carbon emissions in a cost effective manner
- Customers, including low income customers, have increased access to wider range of utility and third party services
- EV charging and deployment is promoted
- High levels of reliability are ensured as driven by customers, as and where needed
- Customer satisfaction is increased
- Customers are ensured access to basic electricity service that is affordable
- Financial integrity of the utility is ensured
- Other



PBR Survey Results - PIMs

November 2018 Mtg:

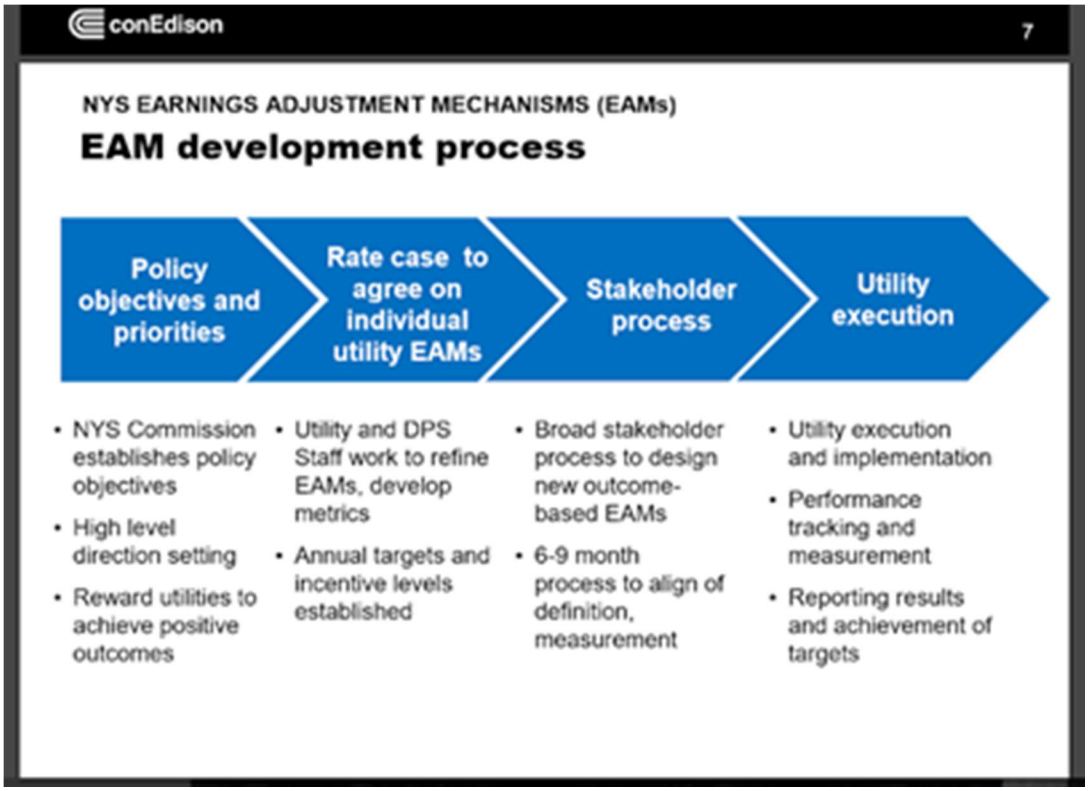
In the November 2018 working group meeting, WG3 heard from Lori Lybolt, ConEdison, on "Reforming the Energy Vision (REV) in New York: Earning Adjustment Mechanisms (EAMs)," highlights including:

- Most states in US have cost of service (COS) ratemaking, with penalties around SAIDI, customer service incentives (CAIDI). They are input based incentives.
- New York State established clean energy policy objectives, regulatory commission adopted objectives and during the REV process, the commission

provided incentives or earning opportunities EAM, with utilities executing on them.

- This is an outcome based approach for clean energy and DER in New York.
- Commission recommended that incentives be positive-only and outcome based, with earnings up to 100 basis points in addition to Return on Equity (ROE).

*The **EAM Development Process** was:*



Credit: ConEdison

WG3 also heard from Todd Bianco of the Rhode Island PUC Staff on, “Performance Incentives and Regulation in Rhode Island’s Power Sector” including their application of incentive policy based on least cost procurement standards. The Rhode Island PUC is still “grappling” with overarching questions around PBR:

- When are PIMs appropriate?
- How does a PUC use PIMs/ PBR to stand in for market competition – what do market customers incentivize?
- What criteria should be used to evaluate PIMs?
- Do these criteria provide enough guidance to design PIMs?
- How would we transition PIMs into a utility’s core business to effectuate PBR?

As a follow up to the October meeting and the PBR survey results, SEPA constructed a second PBR survey in an effort to eliminate some of the unintentional bias designed into the first survey. Also, WG3 members committed to ensuring each company would submit only one response.

The second survey attempted to get WG3 input on the prioritization of PIMs. The results of the second survey are shown in Figure below.

Outcome	% Voted as Priority 1
DER deployment are increased	9.09%
Load is managed to best utilize existing systems cost effectively thus deferring capital investment	18.18%
Pollution and carbon emission reductions in cost effective manner	27.27%
High levels of reliability are ensured	20.00%
Customers are ensured access to basic electricity service that is affordable	9.09%
Increase grid resiliency	18.18%

PBR Survey Results – PIM Prioritization

December 2018 Mtg:

In the December 2018 working group meeting, WG3 heard from Patti Boyd, Senior Technology Strategist, DOEE/DCSEU who presented on DCSEU's FY 2021 Benchmark/Metrics. In 2008, the Clean & Affordable Energy Act established DC Sustainable Energy Utility (DCSEU), with the contract implemented by Vermont Energy Investment Corporation (VEIC). Patti pointed out the incentive mechanisms established to evaluate DCSEU's performance. In DCSEU's case these mechanisms are positive (incentives) and negative (penalties) based on performance.

Additionally, PEPCO's Tyler Wolverton presented on "Exelon Merger Commitments and Pepco Existing Quality Metrics." The metrics that Pepco is measured on are penalty only with no incentives for improved performance.

WG3 members also discussed the results of the second PBR survey and initiated an exercise of mapping a list of potential PIMs to the MEDSIS principals.

January 2019 Mtg:

In the January 2019 working group meeting, WG3 heard from Anne McKibben, Policy Director, Elevate Energy, on ComEd Real Time Pricing Program, highlights including:

History of Dynamic Pricing in Illinois

2003-2006: Pilot Program (1,500 households) to address peak demand

2007 - Present: ComEd's Hourly Pricing Program, featuring: real-time hourly pricing, with 29,327 households on pricing program and 3.5 million households total in service territory, with full AMI roll-out.

2007 - Present: Ameren Power Smart Pricing, featuring day-ahead hourly pricing, with 13,289 households on program and 1.5 million total households. There is a monthly participation fee (for smart meter cost).

Also in the January 2019 working group meeting, WG3 heard from Joe Janocha, PHI; Peter Blazunas, Pepco; Steve Sunderhauf, PHI who presented on PHI's experience with innovative rate design across the Pepco utilities in the Mid-Atlantic. Highlights included:

- PEPCO offered a dynamic pricing pilot, SMPPI PowerCentsDC, in DC that included a critical peak pricing and a peak rebate program.
- Both pilots produced favorable results with high customer satisfaction results but when proposed by PEPCO for full implementation, the program was denied by the Commission.

SEPA also provide the working group with a compilation of alternative rate designs in place in jurisdictions around the country that were similar to the District (e.g., deregulated jurisdiction with distribution only utility). SEPA shared a database of rates with the WG3 stakeholders and summaries of other dynamic rates being piloted or implemented including:

- SMUD's Time-of-Day rates, with all residential customers eligible for the 2019 implementation
- California Time-of-Use rates for 20 million residential customers across 3 investor-owned utilities, with implementation from March 2019 - October 2020.
- Ontario Time-of-Use rates for 4 million customer in Ontario, including full smart meter deployment to all residential customers.
- New York ConEdison's Innovative Pricing Pilot including residential and small commercial customers
- Ohio Power/Columbus Southern Rates, including optional and experimental rates

The WG3 members also engaged in a continuation of the exercise to map potential PIMs to the MEDSIS principles.

February 2019 Mtg:

In the February WG3 meeting, the members continued the PIM mapping exercise and heard proposals from stakeholders on potential recommendations to make to the Commission. Pepco's Steve Sunderhauf made a presentation, "A Path Forward for Dynamic Pricing" and Nina Dodge of DC Climate Action presented an initial concept around alternative rate design options for commercial customer classes.

The working group also discussed Pepco's inventory of smart inverters and Pepco summarized the status of a smart inverter pilot that is ongoing. This discussion occurred in the Rate Design working group as a result of discussing PIMs that might

apply to an outcome of "DER is increased in the District" with the idea being to tracking the increase of smart inverters as the metric to measuring results.

March 2019 Mtg.

The WG3 March meeting was focused on reviewing additional stakeholder proposals for recommendations to be included in the working group report and reviewing the draft recommendations submitted by SEPA. The WG3 members also finalized their exercise of mapping PIMs to the MEDSIS principles.

WG 4: CUSTOMER IMPACT

August 2018 Mtg:

The August Customer Impact working group meeting's primary focus was on developing a working group charter. During the meeting working group members determined the key questions and desired outcomes they would like to accomplish through the MEDSIS working group process and developed the Customer Impact working group charter.

September 2018 Mtg:

In the September 2018 working group meeting, WG4 heard from Warren Myers, NY DPS, on New York's Cost Benefit Framework and VDER Process, highlights including:

NY's benefit cost framework factors in bulk system benefits, distribution benefits, and societal benefits. New York embarked on comprehensive value of DER (VDER) tariff approach as a next step to their net metering (NEM) policy. NEM was resulting in cost shifts primarily within customer classes (not across customer classes). The transition to value based tariff allowed NEM customers to stay on NEM or opt in to new tariff.

They are currently in Phase 1 of their transition with some issues around their transition mechanism and complaints that new tariff is overly complex and "un-bankable". New York is addressing these issues moving forward. While demand rates for residential customers are controversial, the New York experience suggests they are best for addressing capacity which is what really drives time and location differences.

October 2018 Mtg:

At the October 2018 working group meeting, WG4 heard presentations highlighting the current status of customer education, outreach, and engagement strategies in Washington, DC by a variety of organizations, including:

- DC Office of the People's Counsel (OPC): Customer Impact and Engagement
- ACCES: Consumer Resources and Consumer Choice Survey
- Oracle: Delighting Customers with Grid Modernization
- Arcadia Power: Positive Customer Impacts from an Energy Service Company
- Pepco's Customer Engagement

November 2018 Mtg:

In November, the Customer Impact working group meeting was dedicated to learning about low-income programs in the District and around the country. During this meeting, working group members heard from several speakers.

Kenley Farmer, Associate Director at D.C. Department of Energy and Environment (DOEE) presented on multiple low-income programs in the District such as the Low-Income Home Energy Assistance Program (LIHEAP), the Weatherization Assistance Program (WAP), Utility Discount Program (UDP), and the income qualifications for these programs. DOEE also presented on the Solar for All initiative established by the Renewable Portfolio Standard Expansion Amendment Act of 2016.

Theodore Trabue, Manager at the D.C. Sustainable Energy Utility (DCSEU) also presented from District perspective on low-income energy efficiency programs. DCSEU explained that there has been $30 million dollars invested into energy efficiency programs in vulnerable communities that will lead to over $50 million in lifetime savings.

Rick Counihan, Head of Energy Regulatory and Government Affairs at Nest gave a national perspective and presented on Nest's Power Project that supports low-income communities around the U.S. Rick overviewed the four ways Nest works to help low-income households:

1. Providing Nest thermostats to existing low-income programs
2. Partnering with Habitat for Humanity to put Nest thermostats in new homes
3. Creating the Nest Power Project website where people can go to give help or get help
4. Nest's website identifies low-income energy assistance programs in the residence local area and allows visitors to register for or donate to these programs that raises awareness nationally about energy poverty

Alexandra Wyatt, Policy and Regulatory Manager at GRID Alternatives MidAtlantic. Alexandra presented on Grid Alternatives' three main focus area which were low-income solar installation, workforce development, and policy and program development.

December 2018 Mtg:

In the December 2018 working group meeting, WG4 heard from Michael Murray, Mission: Data, on customer data & access protection key topics, including:

- Three categories of data to consider:
- Individual customer data, with access consent based
- Aggregated and anonymized data (zip code, city block, multi-family dwelling)
- Centralized generation (involves security concerns)

There are global trends around "data portability," or the idea that customer data should be able to be transferred to other service providers with customer consent.

In 2014, California was the first state to have a data access policy. By 2018, the GreenButton connect program has been adopted by 5 states (California, Texas,

Colorado, Illinois, New York), with 5 states considering the program (Arkansas, Michigan, Ohio, North Carolina, Maryland, New Jersey).

Also In the December 2018 working group meeting, WG4 heard from Kwame Canty, Edison Electric Institute, on low-income (LI) and underserved customer program key topics, including:

- Disadvantaged customers or underserved communities are often not determined by economic status, but rather by geography, environmental quality, and other demographic factors.
- Types of electric company low-income assistance programs include bill-based support and technology- and behavior-focused programs, with programs bringing technology initiatives to underserved customers are relatively new.

Pepco highlighted that important information for developing robust low-income programs is spread across organizations within the District. For instance, DOEE has the ability to do income verification whereas Pepco does not. Pepco advocated for bidirectional information sharing in order to better serve low-income residence in the District. In addition to highlighting the need to identify not on low-income but also disadvantaged groups, EEI also reviewed several utility low-income programs around the country focused on solar and electric vehicles:

Utilities around the country are providing LI programs, including programs focused on solar and electric vehicles:

- Arizona: APS Solar Communities Program: Solar made accessible to income-qualified customers (limited- and moderate-income customers). APS owns and is responsible for the rooftop solar systems, and customers receive monthly $30 bill credit.
- South Carolina: Duke Energy Progress Shared Solar Program: Community shared solar project for qualifying low-income participants that are part of a larger community solar project. The project features 1 MW of shared solar with 400 kW allotted for low-income customers and another 200 kW for households 300% below poverty line in that territory.
- New York: ConEdison Low-income Solar Program: The NYPSC approved a program to provide 800-1,600 low-income customers with clean energy. ConEdison will own and manage solar panels on company-owned roofs and grounds, with generation servicing low-income customers and these customers seeing a direct bill reductions (projected at $5/month in Phase 1).

California Statewide: Multi-Family Affordable Solar Housing (MASH) Program – Used by PG&E, SCE, SDG&E -Provides solar incentives for qualifying affordable housing multi-family dwellings. Established in 2008 as part of the California Solar Initiative program and funded via state legislation.

- PG&E Electric Vehicle Charge Network -15% of EV charging stations to be installed in “disadvantaged communities”

- Southern California Edison Charge Ready Pilot Program - 50% of EV charging infrastructure to be installed in “disadvantaged communities”
- Florida: Duke Energy Electric Vehicle Charging Program: The company’s EV plan focuses on placing charging infrastructure in underserved communities, with 10% of charging stations located in income-qualified communities.
- Massachusetts: Eversource Electric Vehicle Program: EV program will be targeted toward disadvantaged communities
- Rhode Island: National Grid Modernization Plan: National Grid settlement in August 2018 authorized $13.6 million over three years in grid modernization, including investment in EV infrastructure and storage. Both technologies will be targeted in part at low-income customers, including 25% off for income-eligible customers.

Certain PSC/PUCs have made allowances for utilities to serve LI customers in deregulated markets, including:

- New York: The NYPSC allowed New York utilities to own generation (including storage) as a way to ensure low- and middle-income customers had equal access to the benefits of grid modernization. This determination allowed the approval of ConEd’s low-income solar program.
- Massachusetts: The state legislature approved an energy bill in 2016 allowing utility ownership of storage as a way to serve low-income customers and achieve state environmental goals.

EV infrastructure programs in low-income areas are the most common, with solar programs being less common, as they must be regulator-approved and are not allowed in most deregulated markets.

January 2019 Mtg:

The focus of the January Customer Impact working group meeting was on customer data access and protection. During this meeting working group member heard from Lisa Schmidt, President and CEO, Home Energy Analytics (HEA) and Steve D’Angelo, Chief Technology Officer, Tangent Energy.

Home Energy Analytics presented on what could be learned from three levels of AMI data including:

- One time manual downloads
- One time API access : Customer requests data access from the utility website and/or customer provides authentication
- On-going API access: Customer provides ongoing access and third parties can access customer data for extended periods of time
- HEA also highlighted criteria for supporting third parties including easy customer access, clear and complete instructions, customer support for third parties, and test accounts for integration.

Tangent Energy presented on commercial and industrial customer data access. During their presentation, Tangent Energy explained they collected data in one of two ways. The first, and primary way, is electronically through Green Button Connect. If Green Button Connect is not available, they install their own hardware that collects information from the meter directly. Tangent Energy explained that installing hardware to collect data makes sense for C&I customers who might see $100k in savings but would not make sense for a residential customer to install.

February 2019 Mtg:

In February, the Customer Impact working group heard from Melissa Dias, Climate Program Analyst at the D.C. Department of Energy and Environment (DOEE) on the community engagement strategy through the Equity Advisory Group in Ward 7 and the resulting recommendation for a resilience hub.

DOEE presented the following process for community engagement:

Later in the meeting, Thaddeus Johnson, Assistant People's Counsel at the D.C. Office of the People's Counsel (OPC) presented on key considerations for the working group to consider. The first was reviewing the Customer Bill of Rights (CBOR) and making sure it is updated as new technologies come onto the grid and customers effect customers in new ways. The second key consideration was ensuring there is consistent messaging around programs that are currently being offered and on outputs of the MEDSIS working group process. The final considerations to consolidate program offerings into one central repository that customers can reference for their information needs.

March 2019 Mtg:

In March, the Customer Impact working group heard from Alexandra Fisher, Policy Analyst at DOEE who presented an updated resilience hub recommendation and proposed a resilience hub definition for the District. Working group members also heard from Adrienne Mouton-Henderson, Assistant People's Counsel at OPC who stressed the importance of improving the customer complaint process to be more efficient at addressing these issues. Both DOEE and OPC's remarks are captured in more detail in Chapter 5 Section 4 of the report.

WG 5: MICROGRIDS

September 2018 Mtg:

In the September 2018 working group meeting, WG5 heard from Jeffrey D. Roark, Technical Executive Power and Delivery Utilization, EPRI.

Presenter explained that "The Integrated Grid: A Benefit-Cost Framework" was developed to address this changing market place

Presenter explained that five tests were developed in the 1980's around testing expenditures for demand side programs

Presenter explained there needs to be a separate framework for microgrids due to the diversity of stakeholders and perspective

Presenter explained that stakeholder value propositions differ based on business models

Presenter noted that the only direct benefit of microgrids is increased resiliency with the ability to island from the grid. All other benefits, such as energy cost savings, peak management, integration of DERs, etc. are indirect benefits that don't need to have microgrid capabilities. Presenter stated there needs to be an estimate of reliability and resilience to microgrid customers - Noted the industry does not have a tool for estimating resilience benefits - Noted the DOE ICE calculator is used to calculate reliability benefits

Pepco asked how long the presenter thought it would take until there was an industry wide accepted tool. Presenter replied that right now activity is amongst economists and did not know about the development of a tool. MRC stated that LBNL is working on a tool to calculate resilience,

Presenter noted that some of the microgrid objectives trade-off against each other in optimization

Presenter overviewed DER-CAM by LBNL and explained it is what EPRI engineers use to design microgrids

Presenter displayed heat maps to illustrate how design parameters affect the cost of power using a graphic for base cases and a graphic for microgrid cases

Presenter went through various use case examples

October 2018 Mtg:

In the October 2018 working group meeting, WG5 heard from Mark Ewing, Director, Energy Division, U.S. General Services Agency (GSA). GSA presented on the White Oak Microgrid.

Utilizes a combined heat and power (CHP) system that provides local power by burning natural gas and uses waste heat for steam heating to 15 buildings.

They have their own internal campus distribution system for electricity.

They are active in demand response (DR) for their own purposes not in formal programs.

They provide spinning reserve to support their own grid connection.

They have islanding capability from Pepco.

Campus has critical functions that can't lose power (Bio3 level lab, treating Ebola patients, research facilities, farms)

White Oak microgrid has an energy savings performance contract (ESPC) agreement with Honeywell, est. 2002.

Local power generation (up to 55 MW), and works in parallel with Pepco under a three-party interconnection agreement (GSA, Pepco, PJM).

> Pepco queried if the size of the plant is based on heating or electric demand. Presenter replied that the plant size was based on thermal load. However, it was built in phases; which does not always sync up with demand. Pareto Energy asked about the electric peak demand. Presenter replied not over 20 MW, even in summer (55 MW total capacity).

In addition, Naza Shelley, DCPSC, presented on the state of Commission Microgrid Regulation in the District. Presented on information from the DCPSC MEDSIS staff report.

Electrical company definition + exclusions

What is a customer?

Microgrid Definition Presenter highlighted that there are no current regulations specific to microgrids. Presenter shared that DC PSC staff raised questions in staff report about microgrids including types of microgrids and ownership structure.

- Pepco asked if microgrid service benefits all ratepayers, do any rules differentiate between a public purpose microgrid and a discrete microgrid (campus-only). Presenter replied that there is no differentiation right now.
- Duane Morris commented that in Illinois it was allowed because of the benefit of what the public would learn from a microgrid.

Presenter shared that DC PSC staff raised questions in staff report about microgrids including types of microgrids and ownership structure. PSC concluded there are two main types: area and campus

Presenter highlighted the question: if a microgrid is not electric supplier or company, what is it--and how should it be regulated?

Presenter highlighted the need to distinguish between statutory requirements (customer choice) versus regulatory policy.

November 2018 Mtg:

In the November 2018 working group meeting, WG5 heard from Nitzan Goldberger, State Policy Director, and Energy Storage Association (ESA). ESA discussed their involvement in the MD PC44 process. Presentation focused on the process in PC44 and the actual proposals eventually submitted as part of Storage Working Group. The purpose of the discussion was to see if this approach would work for microgrids in DC.

Maryland Commission grid modernization process started 2 years ago with 6 working groups, including energy storage.

A focus was to explore regulatory hurdles holding storage back.

Focused on how to develop more innovative ways to get more storage in the market, with less focus on ownership.

Developed good construct for regulatory models that might promote storage.

Focus is innovative commercial business models.

- Presenter shared that proposal included 4 models. Each utility has to contract for 2 different ownership models and show good faith effort to contract for each.
    - Utility owned asset – used by utility for revenues by the rate base
    - Utility owned asset but lease to a third party for other uses
    - Third party owned asset that is providing grid services under a contract to the utility. Utility is foregoing a grid investment so utility can rate base the contract cost

In addition, Donna Attanasio, George Washington University Law, presented on elements of microgrid regulation.

Goal: Unlock Blended Value Stake

- Benefits from 3 different sources:
    - Public: Emergency response; increase of renewable penetration
    - System benefits: Grid services
    - Private: Demand cost savings; increased reliability
- If unlock all, you can maximize benefits

Goal to create regulatory model that maximizes benefits

Emerging area of customer services and preferences: are customers willing to pay more for a premium service

Striving to apply comparable measures across all entities performing same/similar function where possible to facilitate investment by private, utility, public entities, or hybrid participants

Remove bias for building versus contracting

Operational obligations unique for microgrid such as responsibility vis-a-vis RTO, emergency situations who has control, internal operations of microgrids versus how it interacts with the grid

Important to consider what happens if it doesn't work: decommissioning and how do we get in and out if needed

December 2018 Mtg:

In the December 2018 working group meeting, WG5 heard from Chris Berendt, Microgrids Resource Coalition (MRC), MRC covered a sampling of leads:

Institutions– traditional university, etc. May have multiple customers – e.g., concessions on campus, may be sub-metered, kind of like a MMA situation but different approach for how utility bill is allocated down to them

Consortium – industrial park, etc. Real Estate Developer – new development. MG part of deal with real estate developer. Tenants starting to specify development must have a MG. One a mixed use development so includes residential customers. May require bring in competitive supplier to serve residential customers.

Utility – NWA solution potentially. PEPCO: MG usually not a NWA solution – cheaper options exist. Group discussed how presentation is more of a national perspective and not DC specific.

Municipality – focus is usually public service resiliency. Similar to utility model Discussion included:

Pepco asked if a hospital gift shop pays rent plus an energy bill. Presenter replied that they are generally on a regular lease, with a pro-rated pass thru energy bill, and are paying utilities thru lease. As far as the utility is concerned, it's one meter. Pepco asked if there was a portion of the hospital gift shop energy bill that changed with usage. Presenter replied yes, it changes with usage.

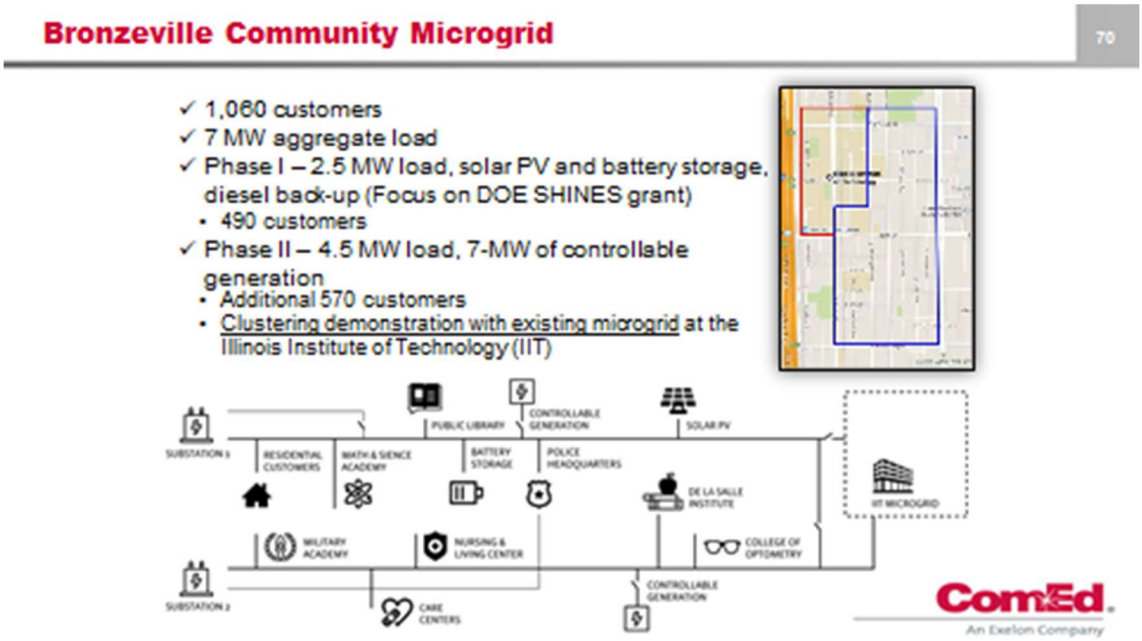
MRC presented on the various Microgrid types

In addition, Susan Mora, Pepco presented on Microgrids Models and Regulatory Constructs

- Select Service Campus Microgrid -- regulatory treatment -- NONE
- Hybrid Select Service Microgrid – regulatory treatment – Developer regulated as electricity supplier; utility regulated as electric company. WGL Energy commented that MEDSIS is future-focused, and should find opportunities to test new financial and regulatory constructs.
- Hybrid Public Purpose Microgrid – regulatory treatment – Developer regulated as electricity supplier; utility regulated as electric company.
- Public Purpose Microgrid – regulatory treatment – Utility regulated as electricity supplier and electric company

January 2019 Mtg:

In the January 2019 working group meeting, WG5 heard from Peter Tyschenko, Commonwealth Edison (ComEd) on the Bronzeville Community Microgrid in Illinois:



Credit: ComEd

On February 28, 2018 the Illinois Commerce Commission (ICC) issued a final order approving the Bronzeville Community Microgrid (BCM), including two-phased construction. The BCM features third-party ownership of generation through a distribution capacity RFP, with ComEd owning the Battery Energy Storage System. The BCM serves a distribution function and costs should be recovered through distribution formula rates. ComEd will work with ICC staff on proposals to integrate more renewable DERs into the project and reduce its carbon footprint. Additionally, the project Benefit-Cost Analysis is in process, with ComEd determining metrics, baseline data capture, and benchmarking.

February 2019 Mtg:

In the February 2019 working group meeting, WG5 heard from Tom Jones, Vice President, Administrative Services, Chesapeake Company on Energy Conservation, Sustainability & Resiliency. Tom spoke on their microgrid.

- Single customer microgrid
- Third party lease with an PPA
- Public community college
- Emergency shelter
- Medication Administration point

Urban Ingenuity commented that they effectively used the microgrid to expand hosting capacity. WGL Energy asked if Chesapeake College qualifies as a microgrid. DOEE replied yes, as it can island and still meet its critical load. Pepco commented that the case study offers insights into challenges and points of regulation. DC Climate Action asked if Chesapeake College has gone into emergency mode since adding storage. Presenter replied they've had short-term losses when they set up as a shelter, but no long-term losses.

March 2019 Mtg:

In the March 2019 working group meeting, WG5 heard from Alex Fisher, DOEE to talk about a proposed way of looking at regulatory treatment through a flow chart. Presenter highlighted that this flowchart is meant to be a tool, and the list is not exhaustive or inclusive of the specific regulations that should or shouldn't be applied to microgrids. DOEE presented the need to establish a definition of a microgrid operator for multi-customer microgrids and the opportunity to develop light touch regulation for microgrid operators of multi-customer microgrids.

Also in March, Shalom Frank, Urban Ingenuity, spoke on the Gallaudet University Single Customer Campus Microgrid and stakeholder discussed the appropriate regulatory treatment of such a microgrid. Shalom continued to speak about the potential expansion of this microgrid to be a Multi-Customer Microgrid. MEDSIS Consultant facilitating a discussion on the appropriate levels of service requirements and regulations that should be applied to this microgrid. Some stakeholders believe that multi-customer microgrids should be held to standards parallel to Electricity Suppliers, while handling level of reliability and compensation structures up to private contracts between the customers and microgrid operator/provider. Other stakeholders believe that multi-customer microgrids effectively function as a utility serving multiple customers electricity and should be held to standards parallel to Electric Companies.

WG 6: PILOT PROJECTS

August 2018 Mtg:

Pilot Projects working group did not begin until October

September 2018 Mtg:

Pilot Projects working group did not begin until October

October 2018 Mtg:

This was the first meeting of the working group and time was spent establishing the charter and key questions and outcomes as defined by the stakeholders participating in this group.

November 2018 Mtg:

In the November WG6 meeting, John Howley of DCPSC Staff presented on "Proposed MEDSIS Grant Funding Parameters and Proposed Demonstration Projects" which reflected Staff's initial recommendations on Pilot Projects as documented in the MEDSIS staff report. Upon completion of John's presentation, the WG6 members documented the following:

Pilot and Demonstrations

Demonstration projects require a waiver from the Commission and should be identified in the application

Parameters should include reference to scalability or replicability

Exclusions

EE programs should be allowed in coordination with FC1148 and DCSEU program

Better define the approach for addressing "unproven technologies"

Key Considerations

MEDSIS pilot project process should not impede current projects

Grant Funding Criteria

Rather than evaluating only the environmental benefits, the environmental impact as a whole should be considered

Process & Timeline

Ensure the funding of multiple projects by establishing a ceiling to the funds awarded

Refine the duration/range for each phase of the pilot project process

December 2018 Mtg:

In the December 2018 working group meeting, WG6 heard from Mike Gravely, California Energy Commission, with an overview of EPIC Funding:

Created by the California Public Utilities Commission (CPUC) in December 2011 to support investments in clean energy technologies that provide benefits to the electricity ratepayers of PG&E, SDG&E, and SCE.

Funds clean energy research, demonstration and deployment projects that support California's energy policy goals and promote greater electricity reliability, lower costs, and increased safety.

The Energy Commission through EPIC will fill critical funding gaps within the energy innovation pipeline to advance technologies, tools, and strategies of near zero-net-energy residential homes and commercial buildings, high-efficient businesses, low-carbon localized generation, sustainable bioenergy systems, electrification of the transportation system, and a resilient grid that is supported by a highly flexible and robust distribution and transmission infrastructure.

EPIC funds will provide approximately $162 million annually from 2012-2020 primarily to address policy and funding gaps related to the development, deployment, and commercialization of next generation clean energy technologies

EPIC funds come from rates charged to electricity customers of PG&E, SDG&E, and SCE.

Project Eligibility Criteria

EPIC Project Eligibility Criteria

	Applied Research and Development	Technology Demonstration and Deployment	Market Facilitation
3-Year Program Area Funding	Approx. $168 million	Approx. $161 million	Approx. $66 million
Estimated Min./Max. Award per Recipient	$250,000 to $3 million	$1 million to $5 million	$25,000 to $3 million
Match Funding Requirement*	None	20 percent of the requested EPIC funds	None
Estimated Funding to Match Federal Program Investments	Up to 10% to support federal cost share opportunities	Up to 10% to support federal cost share opportunities	None

* Applicants providing match funds beyond the minimum requirements will receive higher scores during the proposal evaluation.

10

Credit: CEC

SEPA also compiled information on how other pilot program funding mechanisms work and documented its findings for WG6 review:

Program and Pilots Evaluation Criteria and Scoring Case Studies

New York REV pilots via REV Connect Background

Funded by the New York State Energy Research and Development Authority (NYSERDA)

Focus is to provide businesses and electric utilities new opportunities to partner and create business models and deploy advanced energy technologies in New York State

Provides technology companies the ability to scan the marketplace for opportunities with New York's utilities and to gain deeper expertise in REV

The overarching goal of REV Connect is to drive a pipeline of ideas, with their current target being 140 ideas by June 2018.

Ideas submitted to REV Connect will be evaluated against a predetermined set of criteria, and will be presented to utilities based on their needs and priorities.

Aims to identify and advance at least 12 business models that are executed between a utility and a market partner, either in the form of REV demo, an innovative energy efficiency program, or a non-wires solution project.

Governance

REV Connect is an initiative of the New York State Energy Research and Development Authority (NYSERDA)

The REV Connect team is comprised of a cross-section of subject matter experts: Navigant, New York Battery and Energy Storage Technology Consortium (NY BEST), Modern Grid Partners, and NYSERDA.

Submissions

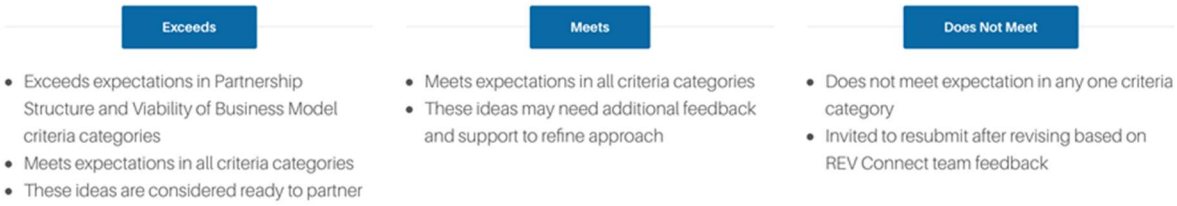
The REV Connect team responds to submissions within five business days and if submission meets the minimum requirements submitter will be invited to have a qualification consultation with a member of the REV Connect team.

Within approximately three weeks of the consultation, REV Connect will provide submitter with initial feedback and summarize the idea to the New York State investor-owned utilities (CHG&E, ConEd, National Grid, NYSE&G, O&R, RG&E) and New York State energy-related agencies and authorities (including the Public Service Commission/Department of Public Service, NYSERDA, the Office of the Governor, the New York Power Authority, LIPA, and PSEG – Long Island as a contractor to LIPA).

After that, REV Connect will periodically provide feedback as received from the New York utilities and the State energy agencies. Each of the utilities working with REV Connect has designated staff who engage with the REV Connect team at regular intervals to review submission ideas and provide feedback. These staff also work with REV Connect to determine how to route ideas to the relevant business and technical personnel within their company.

Review Criteria for Facilitation

The REV Connect team uses the following criteria to evaluate and categorize submitted ideas



Facilitation Criteria

The REV Connect team evaluates ideas based on five criteria categories. This is an initial screen using these criteria. The decision to proceed with a partnership lies with utilities and submitters.

- Viability of Business Model: Does the business model articulate all elements, including unique value propositions, and address market needs and opportunities?
- Utility Partnership Structure: Does the proposed utility partnership structure employ an innovative approach beyond the conventional vendor/utility procurement relationship?
- Submitter Capability: Does the team have experience in developing similar ideas with successful outcomes?
- Advancement of REV: Does the idea advance REV by addressing REV Objectives, enhancing Distributed System Platform (DSP) functional capabilities, or supporting market-based approaches?
- Uniqueness of Innovation: Is the business model idea unique and does it take an innovative approach to address needs as compared to conventional solutions?

Qualify Consultation Guide

A Qualify Consultation Guide is used to ask questions of submitter during a consultation process

- Consists of 6 key questions that are asked in all cases
- Includes 16 optional questions related to the 5 Facilitation Criteria (Viability of Business Model, Utility Partnership Structure, Submitter Capability, Advancement of REV, Uniqueness of Innovation)
- 3 non-criteria assessment questions

WG6 members also continued their discussion of staff's initial recommendations around MEDSIS grant funding parameters and concluded the following:

<u>Key Takeaways from Gap Assessment:</u>

Pilot & Demonstrations:

Definitions from staff report:

- Pilots Project: Small scale trial for larger application
- Demonstration Project: Required waiver regulatory requirement to complete that project (any demonstration project)

Group Consensus//Decision:

- Parameter should include language to scalability and replicability
- Remove distinction between pilot and demonstration project
- Require applicants to identify whether or not their project requires a regulatory waiver

Exclusions:

Group Consensus//Decision:

- Change parameter section from “exclusions” to “selection criteria”
- MEDSIS funds not to be used for technology R&D, startups/venture capital funding, or commercialization in general
- Utilize DOE technology readiness criteria

Key Considerations:

Group Consensus//Decision:

- Focus on Technology-ready DER and bringing new products to DC market (not R&D)

Grant Funding Qualifications Parameters:

Group Consensus//Decision:

- Add language requiring applicants to supply a history of sourcing/funding

Process & Timeline:

Group Consensus//Decision:

- Address the criteria for transitioning through phases
- Incorporate flexibility into phases to accommodate a wide-range of projects
- Wordsmith phase titles to allow for more fluidity
- Establish time ranges for phases
- Insert project extension/reduction (time based)

Pilot Project Selection:

Options listed in Staff Report:

- Independent board
- Commissions staff with assistance from independent consultant

Discussion:

- Initiate a stakeholder advisory board (PEPCO)

- Technical guidance/governance
  - Individual board (advising, not deciding: NYSERDA, CEC, DOEE, Mass, Pepco, OPC, IREC, RAP, RMI, CA Distribution Planning Advisory Group)
  - Commission + Consultant
  - Stakeholder advisory consultant
  - Industry reviewers

Group Consensus//Decision:

- Change language from “independent consultant” to “third-party advisor”

Monitoring Reporting & Evaluation:

Discussion:

- Ensure enough data will be collected from the pilots to inform long-term policy decisions
- Pilot projects are designed to test for specific outcomes and gather objective data--both on the technical performance of DER as well as their cost and value

Group Consensus//Decision:

- At a minimum: 3 quarterly reports and 1 annual financial report summary, with option for board to increase report frequency as needed

January 2019 Mtg:

The January WG6 meeting was a working meeting with WG6 members discussing the Pilot Projects analysis of grant funding parameters and pilot project scoring approaches that evaluated proposals against the MEDSIS principles leveraging desired outcomes documented by the DIAA WG.

Innovative pilot projects from around the country were also discussed including those in Figure below.

Pilot Program	Impacts for MEDSIS
Green Mountain Power BYOD Pilot	First utility program using VPP type program to discharge batteries to reduce demand and create savings to all customers Impact to MEDSIS - Tests coordination between utility and third parties to control load
Liberty Utilities BTM Pilot	Similar to GMP program. Stage 1 utility owned only. Stage 2 included third party – utility owns but third party can install. Includes TOU rate structure – impact to MEDSIS to ensure proposers include non-technology components or constraints are included in pilot structure Impact to MEDSIS – proposal should be able to scale past just being a pilot Impact to MEDSIS – proposal should test new utility operation of these technologies but also third party role
ConEd Smart Home Rate Pilot	Forward looking and innovative but also complicated. Includes a "hold harmless" provision to protect customers Focused on gathering data to help inform future rate design Multiple vendors involved Delayed because of need to install AMI Had issues with data availability tied to AMI Impact to MEDSIS – consideration if proposer's pilot addresses all factors impacting ability of the pilot to be successful

Innovative Pilot Programs

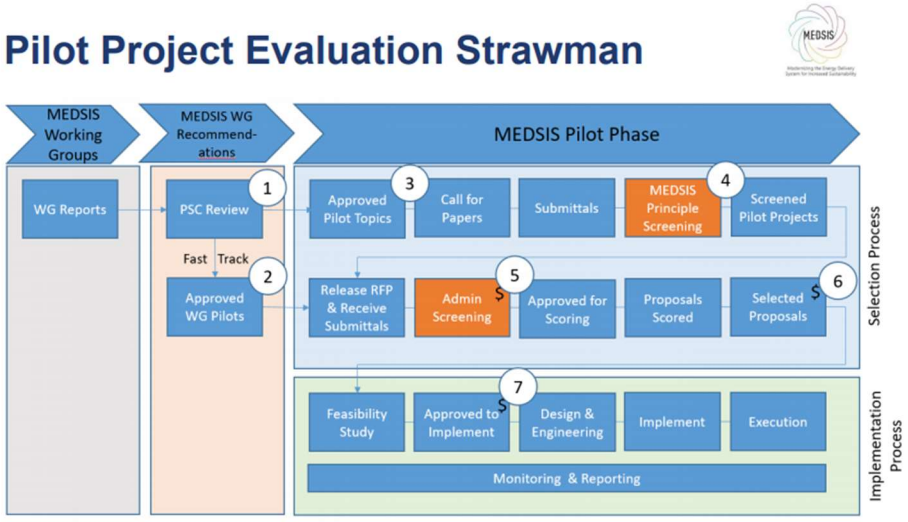
After discussing innovate pilots, working group members reviewed the DOE Technology Readiness Level (TRL) model and reached broad consensus on the following:

1. Conducting a TRL level assessment of applications makes sense
2. Applications with TRLs of 6 and below will not be eligible for MEDSIS funding
3. Applications with TRLs of 7 and 8 will be eligible for MEDSIS funding but will be subject to higher risk coverage and burden of proof information in the application
4. Technologies and solutions commercially deployed with a TRL of 9 will be available for MEDSIS funding
5. TRL levels attained in other jurisdictions could possibly be scored at a different TRL level in DC because of unique factors within the District - which would have to be taken into account when reviewing pilot applications

Additionally, members discussed the need to ensure that the proposed technology integrates with District specific systems and/or technologies and that the pilot process includes a description of a clear purpose of what the pilot is testing.

February 2019 Mtg:

The February WG6 meeting was a working meeting with WG6 members discussing the Pilot Projects selection and scoring approaches based on the strawman proposal developed by the MEDSIS Consultants.



Draft Pilot Project Evaluation Strawman

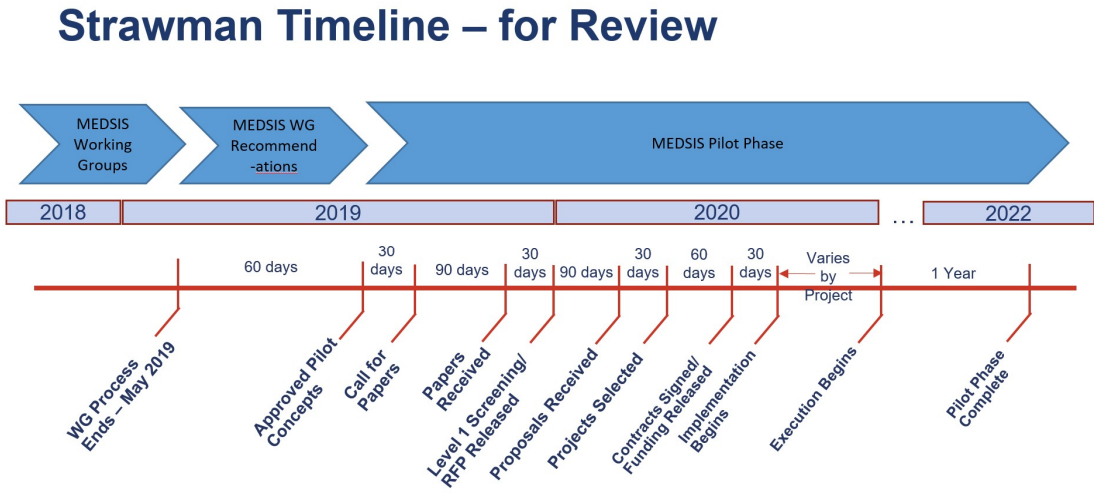
While reviewing the Pilot Evaluation Strawman diagram, working group members discussed important topics such as

- The pursuit by PEPCO to pursue pilots outside of the MEDSIS funding process is not limited by the proposed process
- How a “fast track” process could be utilized for pilots recommended through the MEDSIS working group process, and
- How MEDSIS funding would be allocated between Fast Track and non-Fast Track pilots.

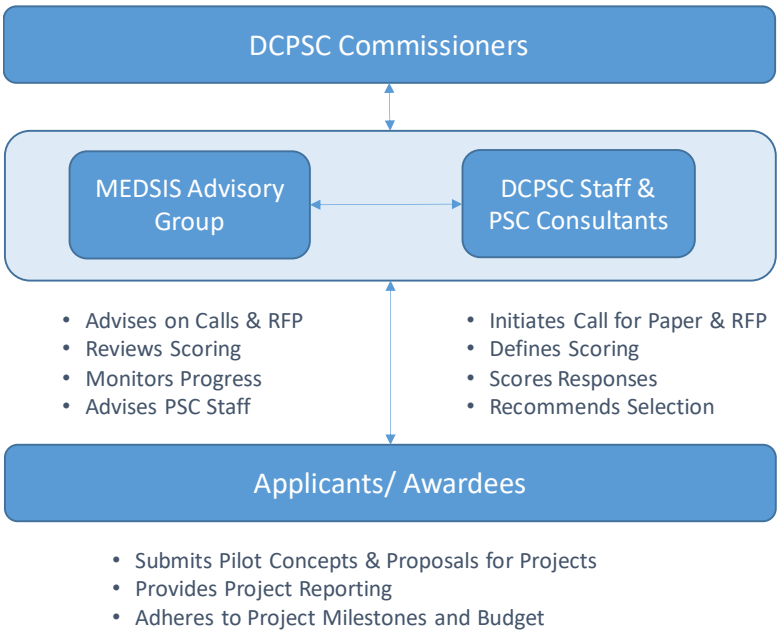
Additionally, working group members reviewed a Pilot Project Scoring Strawman for the Pilot Selection Process that included a Level 1 and 2 screening prior to a full Evaluation Scoring of pilot proposals. It was determined that the proposed strawman was a good start but would need to be refined. For the Level 1 screening, stakeholders agreed the measurable objectives to the MEDSIS Principles needed to be reworked to better serve as pilot selection criteria.

March 2019 Mtg:

The March WG6 was a working session that focused on review of the SEPA revised strawman for Pilot Project Selection and Scoring as well as a new strawman on Pilot Project Implementation Timeline and on Pilot Governance. These new strawmen are shown in Figures below.



Credit: SEPA – Pilot Project Implementation Timeline



Credit: SEPA - Pilot Project Governance Model

Finally, WG6 discussed pilot project funding and if funding should be capped by project.

ADDITIONAL INFORMATION PROVIDED TO WORKING GROUPS BY SEPA

Public Utility Commission Interview Summaries

MEDSIS consultants interviewed or corresponded with PUC/PSC staff from: Maine, Maryland, New Jersey, Pennsylvania, and Rhode Island to solicit key learnings on state grid modernization proceedings. Key takeaways included:

Distribution System Planning (DSP)

Maryland PSC drivers for evolved DSP include: PC44 working groups, aging infrastructure, and limited load growth. Maryland PSC does not have a formal integrated distribution planning (IDP) docket, but addresses through rate cases. Utilities are not currently required to file a capital improvement plan, and file capital improvements in general rates cases. A DSP working group will be established under PC44 in 2020-21.

New Jersey Board of Public Utilities (BPU) drivers for evolved DSP include: solar and storage goals, and clean energy mandates of 100% renewable energy by 2050, and 80% greenhouse gas (GHG) reduction by 2050. The New Jersey BPU acts as both the state energy office and PUC. In 2018, New Jersey BPU conducted 5 working groups and 7 public meetings for stakeholder input on New Jersey's Energy Master Plan (EMP), with 2019 planning work including NWA and Distribution System Planning. Other related items include a 2018 Community Solar Order requiring hosting capacity maps from IOUs, and a 2018 staff recommendation for JCP&L, PSE&G and ACE to submit AMI feasibility studies.

Pennsylvania PUC has a long-terms infrastructure improvement plan (66PACS Section 15.52), including a distribution system improvement charge enabling cost-recovery as costs are incurred, eliminating regulatory delay. If a utility wants to change distribution system or add lines / add distribution, they need to seek Commission approval.

- Rhode Island PUC drivers for evolved DSP include: aging infrastructure, stakeholder access to data, a distributed generation feed-in-tariff, and limited load growth. Evolution of distribution system planning has included:
- 2006: Least-Cost Procurement Statute requiring National Grid to file 3-yr Energy Efficiency Procurement Plan and an annual System Reliability Procurement plan
- 2016: Infrastructure, Safety and Reliability Order encouraging National Grid to develop long-term plans considering distributed generation with load growth.
- 2018: National Grid launched a system data portal resource for developers and contractors, including distribution feeder and substation information.
- In 2019, National Grid proposed a system reliability procurement report, including system data, electric vehicles, and NWAs. Additionally, in 2019, National Grid to engage stakeholders via an advisory group to develop advanced metering functionality (AMF) and a grid modernization plan for Rhode Island PUC review.

Non-wires Alternatives (NWA)

Maine Public Utilities Commission (MPUC) allows an exception to utility ownership of generation if it improves reliability and increases the efficiency of the grid, with NWA classified as an exception. In 20xx, the MPUC rejected an order developing a third-party NWA coordinator as it wasn't in the public interest. The MPUC wants the utility to set up NWA programs that incentivize NWA development, and believe they are well suited to be the coordinator. For further information, see Order in Docket No. 2016-00049, 35-A M.R.S. sec. 3132, and 35-A M.R.S. sec. 3132-A.

Maryland Public Service Commission (PSC) reported that there is no formal NWA docket. Currently, investor-owned utilities (IOUs) file capital improvements within general rate cases, with IOU proposed projects primarily for grid reliability needs, due to very limited load growth. IOUs are only allowed to use NWA for reliability purposes and are not allowed to sell into wholesale markets. In 2018, BG&E proposed a NWA 3-5 MW storage system for grid reliability and to defer substation upgrades.

The New Jersey BPU addresses NWA as part of New Jersey's Master Energy Plan. In 2018, the New Jersey BPU contracted with Rutgers University for an energy storage analysis white paper.

Pennsylvania PUC does not currently have any requirements or policies that specifically address non-wires alternatives or solutions. The main focus of the required long-term infrastructure plans (LTIP) is reliability, with nothing preventing a utility from proposing to improve hosting capacity and potentially avoid large transformer/transmission upgrades through hosting more DERs, or a third party/stakeholder proposing a NWA during comment on LTIP. The Pennsylvania PUC's Solar Collaborative Working Group works on interconnection rules to streamline rules/requirements, with a PECO-developed map of where interconnection costs are high/low.

Rhode Island PUC requires utilities to issue two annual filings: Energy Efficiency Alternative to Supply, and System Reliability and Procurement for NWA and DR related investment programs and investments. The Rhode Island Energy Efficiency and Resources Council (EERC) review's filings and votes to approve, including a cost-effectiveness report and a public docket for comment and intervention. Rhode Island PUC is considering an "open RFP" technology-agnostic process.

Performance-Based Regulation (PBR):

Maine PUC's current investigation into utility rate-setting mechanisms regarding non-wires alternatives is Docket No. 2018-00171.

Maryland PSC reported that PC44 does not include PBR.

New Jersey BPU does not currently address PBR in its Energy Master Plan. Related microgrid feasibility studies will provide further information on tariffs.

Pennsylvania PUC has not approved a performance-based rate or a multi-year rate plan for any Electric Utility at this time. In 2018, the PA legislature passed Act 58 of 2018 that amended the Public Utility Code by adding Section 1330, which reinforces PUC's

authority to approve rate methodologies different than basic kwh rate (such as multi-year rate plans, decoupled rates, formula rates, decoupling mechanisms, performance based regulations). In 2018, the PUC initiated an Act 58 Implementation proceeding at Docket No. M-2018-3003269. Additionally, the PA PUC has an alternative ratemaking proceeding at Docket No. M-2015-2518883.

Customer Impact/Data (Green Button)

Maine PUC Chapter 815 sec. 4 of the Commission rules addresses customer data protection, stating: A utility shall not disclose, sell or transfer, other than for debt collection, credit reporting, or usage reporting pursuant to state and federal law or to law enforcement agencies pursuant to lawful process, or as otherwise authorized by law, Commission rule or Order, individual customer information, including, but not limited to, a customer's name, address, telephone number, electricity or gas usage, or payment history, to a third party without the consent of a customer.

From 2017 - present, the Maryland PSC Competitive Markets and Customer Choice Working Group is investigating GreenButton "Connect My Data" to potentially allow for continuous customer data access from third parties. Currently, BG&E, Delmarva, and Pepco utilize GreenButton "Download My Data" to provide customers with energy usage data.

In 2018, the New Jersey BPU 2018 required IOUs to provide data to contractors through GreenButton "Connect My Data." This includes consolidation of AMI data from master-metered apartment (MMA) facilities and large buildings. Other related items include a 2018 Community Solar Order requiring hosting capacity maps from IOUs, with data available through GreenButton.

In 2008, Pennsylvania Act 129 required Electric Utilities to install smart meters and to provide direct access to the meters and the meter data to the customer and a third party, with customer consent (Public Utility Code at 66 Pa. C.S. Section 2807(f)). Regarding GreenButton, the PUC encouraged all large electric utilities that are required to install smart meters to provide GreenButton interface within the customer portals. PECO and PPL are 100% AMI, with requirement for electric distribution companies (EDC) to provide customers electronic access to data through GreenButton, and data to third party provider through the customer portal.

Rhode Island PUC does not currently have AMI data for residential customers. Utilities are working on GreenButton connect. They are planning to do AMI, with an Advanced Metering Functionality Study required by utility by April 2019, including technology solutions and customer data management and security plan.

Microgrids

Maryland PSC has focused on public-purpose microgrids, and questions around ownership of and cost-recovery of assets. Classifications and criteria need to be developed.

New Jersey BPU is directed to develop microgrid tariffs through feasibility studies.

A.6 Stakeholder Proposals

A6.1 – D.C. CLIMATE ACTION'S PROPOSAL FOR INTEGRATION OF THE NEW INTERCONNECTION AND INTEROPERABILITY IEEE STANDARD 1547-2018 & ADVANCED INVERTER FUNCTIONALITIES IN THE DISTRICT OF COLUMBIA

MEDSIS Working Group 2

Proposed Stakeholder Working Group
For Integration of the
New Interconnection and Interoperability IEEE Standard 1547-2018
& Advanced Inverter Functionalities
In the District of Columbia

DC Climate Action
Update of March27, 2019

In December 2018, the Institute of Electrical and Electronic Engineers (IEEE) adopted the "IEEE Standard 1547-2018 for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interface." The intent of this new standard was to enable significantly higher penetrations of distributed energy resources (DERs) on the grid. The Standard requires interoperability and communication protocols that assure capabilities and benefits of DERs to customers and the grid via advanced inverters and, via a control platform, assure utility grid benefits of DERs.[56]

As described by the Interstate Renewable Energy Council (IREC), the 1547-2018 standard requires DERs to be capable of automatically providing specific grid supportive functionalities relating to voltage, frequency, communications and controls.[57] A variety of options is built into the standard to meet specific needs for DER integration and conditions of the grid, avoiding potential impacts and optimize grid benefits.[58]

Highlights of the new standard include:

- Frequency voltage ride-through for DERs

56 The U.S. Department of Energy explains that the IEEE is now developing testing requirements to be used with IEEE 1547-2018. Once these testing requirements are set, states and local jurisdictions can implement IEEE 1547-2018. Participants at the recent DistribuTech Conference (in February 2019) who are involved in developing the standard for testing requirements anticipated that it would be completed in calendar year 2019. The overall IEEE timeline for full roll-out of IEEE-2018 goes to 2022.

57 IREC IEEE 1547-2018 Primer Release, January 2019: https://irecusa.org/2019/01/new-primer-making-the-grid-smarter-helps-regulators-stakeholders-adopt-and-implement/

58 The 1547-2018 Standard includes several Performance Categories each with different levels of functionalities.

- Voltage control (that increases DER hosting capacity)
- Intentional islanding.

At the heart of the new standard is the "advanced inverter" that provides the "smart" interconnection of DERs to the grid. Communication and advanced data management systems are necessary to operationalize the many potential benefits of this interconnection technology.

IREC says that States or utilities will begin to integrate the IEEE Standard 1547-2018 into applicable interconnection rules and tariffs. Several states have begun the process already, including California and Hawaii which have advanced inverter mandates, and Minnesota whose regulators have launched a workgroup to evaluate the integration of the IEEE standard 1547-2018. The integration of the new standard will benefit from fair, balanced and transparent stakeholder processes to ensure that the perspectives of all impacted stakeholders, including consumers adopting DERs, are reflected.[59]

In addition to the published IEEE 1547-2018 standard, there is a 1547.1 document anticipated by NARUC[60] to be finalized late 2019 covering testing and verification necessary to meet the standard. This means that equipment certified to IEEE 1547-2018 standards is not expected to be on the market until 2020-2021.[61] However, now is the time to begin to implement the new standard.[62]

The District of Columbia Public Service Commission ("Commission") published new Rules on Interconnection in January, 2019, that require a Small Generator Facility (up to 20MW) to comply with the most current approved versions of IEEE 1547 and IEEE 1547.1, along with Underwriters Laboratories ("UL") 6142 and UL 1741. (The District's "Electric Distribution Company" (Pepco) can waive this compliance requirement.)[63]

PJM staff have identified a few IEEE 1547-2018 advanced inverter functionalities they are requesting jurisdictions to adopt in order to meet the bulk power system reliability needs on the transmission side while larger amounts of DERs come onto the grid.

To meet its statutory clean energy mandate, the District needs to expand DERs. It also needs to optimize their deployment for best value both for customers and for distribution

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59 Ibid., IREC.

60 The National Association of Regulatory Utility Commissioners.

61 National Association of Regulatory Utility Commissioners (NARUC): "State Commission Staff Surge Call: IEEE 1547 Revision and Distributed Energy Resource Interconnection Standards." September 24, 2018.

62 NARUC and IREC are explicit about the urgency to begin implementation of the new standard in their guidelines for deployment of IEEE 1547-2018.

63 DC Public Service Commission, Notice of Final Rulemaking, RM-40-2017-01, in the Matter of 15 DCMR Chapter 40 – District of Columbia Small Generator Interconnection Rules and Formal Case 1050, In the Matter of the investigation of Implementation of Interconnection Standards in the District of Columbia. January 25, 2019. See sections 4002 "Applicable Standards" and 4002.5, pages 2-3. https://edocket.dcpsc.org/apis/api/filing/download?attachId=82617&guidFileName=87a05b64-439c-470f-bd06-6b293a5590bf.pdf

grid operations. This means planning well ahead to phase in a wide range of advanced inverter functionalities for use in the DER-distribution grid interface.

Doing this properly requires not only technical skills but also the participation of a broad range of non-technical interests, because technical choices have economic, environmental, and quality of life consequences. Proper planning therefore involves bringing together technical experts from the Commission, the utility and DER installers, as well as stakeholders from the District Government, business groups, and community organizations. The District can learn from the experience of other U.S. jurisdictions in this respect (MA, MN, NJ, NY, CA, HI). The MEDSIS process allows us to prepare for advanced inverter and DERMS (Distributed Energy Resource Management Systems) deployment in accordance with the new Standard as soon as testing protocols and equipment certification are done. Thus, we can benefit without delay from the capabilities afforded by these new technologies to meet our statutory mandates and policies.

Recommendations:

1. Establish a stakeholder working group under the Commission to plan the deployment of advanced inverters and IEEE 1547-2018 standards in time to launch by the 1547 Standard's full roll-out in 2022.
2. The working group should include technical experts from the Commission, installers, and Pepco, and stakeholders from District Government, the business community, and community organizations.
3. The working group would begin its work immediately and complete it in time for full roll-out of the 1547 Standard in 2022.
4. Its scope will include some tasks on which its technical experts would form a subgroup to recommend technically justified functionalities and settings, which the entire group would vet and adopt or modify.
5. Its major tasks would be as follows:
    - Setting criteria (including use cases) for and selection of IEEE 1547 functionalities and settings to adopt for the District.[64]
    - Determining steps and time-line for adoption of the selected standard and the operationalization of its advanced inverter grid-facing capabilities by Pepco management systems.
    - Determining what pilots if any are needed to smooth the adoption of the selected standard and to optimize the advanced inverter capabilities selected.
    - Determine how the utility and Commission should track the deployment of the new advanced inverters, especially by customers who are replacing inverters installed *before* the adoption of the new standard.

64 The 1547-2018 Standard packages functionalities of inverters into "Performance Categories." The choice of which "package" of advanced inverter capabilities standard option to adopt for the District initially, will depend upon the District's goals for DERs, benefit-cost, etc.

- Determine a stakeholder education plan for deployment of the new Standard.
- Determine rulemaking needed for the integration of the selected functionalities of the Standard.
- Determine rulemaking needed for estimating hosting capacity with deployment of advanced inverters.
- Identify policy issues stemming from deployment of advanced inverters (e.g., compensating customers for curtailment of DER – an issue especially vis-a-vis solar developer long term PPAs).

APPENDIX A

RESOURCES

1. **U.S. Department of Energy (DOE) Revised IEEE 1547 standard Will Aid Solar Integration, January 9, 2019**
   https://www.energy.gov/eere/solar/articles/revised-ieee-1547-standard-will-aid-solar-integration
2. **IREC Primer on Adoption of the New IEEE 1547-2018 Standard**
   "Making the Grid Smarter: Primer on Adopting the New IEEE 1547-2018 Standard for Distributed Energy Resources, January 2019."

   Primer Summary:
   https://irecusa.org/2019/01/new-primer-making-the-grid-smarter-helps-regulators-stakeholders-adopt-and-implement/
   Summary Download:
   https://irecusa.org/publications/making-the-grid-smarter-state-primer-on-adopting-the-new-ieee-standard-1547-2018-for-distributed-energy-resources/
3. **NARUC State Commission Staff Surge Call: IEEE 1547 Revision and Distributed Energy Resource Interconnection Standards. September 24, 2018.**
   (National Association of Regulatory Utility Commissioners)
   https://www.naruc.org/default/assets/File/IEEE1547%20surge%20summary.pdf
4. **DistribuTech February 2019 Panels on DER Integration into the Grid and IEEE 1547 Standard**

   This DC Climate Action proposal is informed by panels at the DistribuTech Conference in February on the integration of DERs into the grid, with the new IEEE 1547 Standard and specifically with the deployment with advanced inverters and the communications and software systems needed to manage their functions. [provide links to presentations where possible?]

   Understanding and Implementing DERMS for Grid Services

   (DER Management and Control Track)

   Moderator: Anbiah Renjit, Electric Power Research Institute (EPRI)

   arenjit@epri.com

> "... recent updates to grid codes like IEEE 1547 [?] require DER to provide grid supportive functions but in order to do so, end-to-end integration with utility operations will be required to interconnect and operate more DER on the grid. The logical component that will address this challenge is known as a DER Management System, or DERMS."

DER Roadmap Strategies:

(MEGA Session)

Moderator: Mike Beehler, Burns & McDonnell

Session chair, Raj Chudgar, Viridity Energy Solutions

rchudgar@viridityenergy.com

> "... Leaders from utilities with different levels of distributed generation on their grids and different policies in place [Southern California Edison, National Grid, Entergy and APS] ... will discuss their roadmaps for DER, including why they created the roadmaps, the driving forces behind them and the lessons they have learned.... they will offer advice to other utilities embarking on a DER roadmap strategy."

What You Need to Know About Advanced Inverters and about

IEEE 1547-2018 DER Interconnection Standards

("Decarbonizing the Grid" Knowledge Hub)

Moderator: Aminul Huque, EPRI

(DistribuTech 2019 Mobile App has details about session)

Smart Inverters and Hosting Capacity

("Expanding the Grid" Knowledge Hub"

Moderator: Larry Tussel, Synergi [Electric?]

Virtual Metering Enabled Through Use of Smart Inverters and Smart Consumer Devices

(DER Management and Control Track)

Moderator: Walter Johnson, EPRI

> Discussion of "the results of a California Energy Commission-funded project that is evaluating advanced inverter functionality with the specific goal of enabling higher penetration of photovoltaic systems on the grid ... Among others, the panel topics [included] the status of commercially available smart inverters, functional characterization of the inverters, interactions of smart and traditional inverters connected to the same residential transformer, load control algorithms, and HAN and FAN communications for device coordination."

Deployment Lessons Along the DER Journey

(DER Management and Control Track)

Moderator: Sharon Allan, SEPA

"While there is lots of talk about DER technology being ready, utilities have found some pain points in deployment. In addition, while the definition of DERMS is firming up, many utilities are finding that existing demand response of ADMS software is insufficient and a DERMS platform is required to enable them to manage DER. In this session, utilities ... share where they are in their DERMS deployments and their lessons learned on DER management that includes storage, solar, and EV charging stations."

A6.2 – PEPCO'S PROPOSAL FOR A DISTRICT OF COLUMBIA STAKEHOLDER-INFORMED UTILITY DISTRIBUTION SYSTEM PLANNING AND NWA CONSIDERATION PROCESS

Proposed District of Columbia Stakeholder-Informed
Utility Distribution System Planning and NWA Consideration Process
February, 2019

Recognizing the District's uniquely ambitious DER goals and the DC Commission's direction to stakeholders that they speak to possible changes to utility system planning processes and the consideration of non-wires alternatives (NWA) as part of the utility planning process, Pepco has developed this proposal to offer an opportunity for stakeholder-informed system planning and NWA consideration and solicitation. This proposed planning process change is anchored on Pepco's preparation and submission of the currently mandatory Annual Consolidated Report (ACR). It should be noted that NWA solutions executed directly by the utility or via a contract with a third party are subject to Commission review via the rate case process. Additionally, nothing in this proposal precludes the execution of NWA demonstration projects in advance of the launch of a DSP process.

PROPOSED ILLUSTRATIVE TIMELINE

2019

Pepco convenes 3 stakeholder workshops to:

1. Solicit input regarding the content, format, distribution and reply time needed for "Load Impacting **Factors RFI"**
2. Solicit input regarding what information should be included in the Locational Constraints Report and RFI
3. Help potential NWA RFP respondents better prepare for successful RFP participation

April 1, 2020

- Pepco issues Annual Consolidated Report for 2020-2029
- Pepco issues "Load Impacting Factors" RFI via letters to real estate developers, DER developers and DCSEU asking for the following location-specific information:
    1. To Real Estate Developers: On a project-basis, expected additional load (usage and peak demands) and related electric-infrastructure requested of Pepco via interconnection process, actual capacity needed in 2018 and recalculated capacity requested for 2019 through 2023. (Need building size, volume, use, date when loads come on line, etc.)
    2. To DER Developers: Areas for likely development and the resulting load reductions expected from current and planned projects through 2023. (DER Type, fuel source, size, date, operating mode, inverter type, etc.)

3. To DCSEU: Actual reductions in load (usage and demand) associated with current EE programs and planned EE programs and the associated expected impacts on load through 2023. (proposed EE, impact on demand, energy, date, etc.)
4. To DOEE: Regarding load impacts of new building standards as created via recently approved legislation

June 1, 2020

Real Estate Developer, DER Developer and DCSEU responses to "Load Impacting Factors" RFI due back to Pepco

August 1, 2020

- Pepco issues a "Locational Constraints Report" that presents areas of expected constraint (based on existing load forecasts and data obtained via the "Load Impacting Factors" RFI) that would require traditional solutions in service between 2025 through 2029. These constraints could be addressed, in part or in whole, with DER alternatives that could be executed beginning in 2021.
- Pepco issues RFI soliciting DER solutions to address constraints identified in "Locational Constraints Report." To assist in this response process, Pepco will make data available relative to the size, duration and seasonality of the constraint. It should be noted, participation in this RFI solicitation is not required for participation in the subsequent RFP solicitation.

September 1, 2020

- Responses to "Locational Constraints" RFI due back to Pepco

November 1, 2020

- Based on the "Locational Constraints Report" and responses to "Locational Constraints RFI," Pepco issues constraint-specific RFPs for NWA solutions that identify where and what type of DER solutions are required to provide the maximum benefit to the system while meeting the constraints (i.e. flatten voltage, increase hosting capacity and meet the constraint via battery solutions in a certain area of the feeder, DR, DERs, etc.). With the signing of an NDA, RFP respondents may be able to access, via a secured platform, more granular system data than that supplied in the Locational Constraint Report.

February 1, 2021

- Responses to Pepco-issued RFPs for NWA solutions are due

April 1, 2021

- Pepco issues Annual Consolidated Report for 2021-2030
  - Projects listed for completion 2021-2024 are only adjusted as appropriate based on new information made available via the "Load Impacting Factors" RFI responses

    - Projects listed for completion 2025-2029 include a short summary of the types of NWA proposals that have been received and have passed an initial screening review
- Pepco issues next "Load Impacting Factors" RFI via letters to real estate developers, DER developers, DCSEU and DOEE.

July 1, 2021

- Pepco issues a list of selected NWA solutions for execution in 2021 through 2023
- NWA contracting and/or construction begins

Discussion

Pepco believes that the proposed process represents an evolution in utility system planning, by allowing for greater transparency and collaboration, with a continued focus on providing customers with reliable and sustainable energy. The viability and efficacy of the proposed process is predicated on the various parties sharing common guiding principles, which include:

Timeline

The timeline above is based on the current April 1 due date for the ACR and the process described is annual and iterative. Additionally, it should be noted that this proposed DSP and NWA consideration process will result in learnings that could drive an incremental evolution of the process that could include changes in RFP solicitation approaches, the addition of select reliability projects to the list of capacity projects for NWA targeting, and the downward adjustment of the 'in-service date' threshold for certain classes of target projects from the initial 60 month threshold.

Information

The ability to execute NWA solutions as part of a DSP process will require disaggregated data, both historical trend and future potential for: EE, PV, DR, Battery, EV and other types of DERs. Accurate and timely responses to the Load Impacting Factors RFI are essential for Pepco to objectively create the Locational Constraint Report, craft actionable NWA RFPs, and evaluate 3rd party proposals. As requested and where legally possible, Pepco will maintain the confidentiality of these RFI and RFP responses. To assist in the Locational Constraint RFI response process, Pepco will make available non-sensitive information regarding the constraint. More granular system level data has system security implications and access must be appropriately restricted.

Scope

- While the ACR lists expected projects over a 10-year horizon, the NWA opportunities identified and subject to third-party participation under this proposed process are limited to those system capacity challenges that are forecasted to need a solution in a 6- to 10-year window. This limitation is necessary to allow for traditional solution execution if NWAs are found to be inadequate.

- The applicability of a given DER technology to a specific system need is limited. As a result, for each identified 'locational constraint' put forward for NWA RFP solicitation, Pepco will define parameters regarding specific DER solutions to be considered.

Qualifications

- To qualify for consideration, RFP respondents will be expected to have actionable plans and to comply with Pepco's applicable standards and requirements, including the inclusion of local and diverse suppliers in the District of Columbia.
- To be considered as a solution to a system need, DERs contracted as NWAs shall be subject to appropriate Pepco control and operation regardless of ownership.

Cost and Revenue Models

- These enhancements to Pepco's planning and reporting process will increase Pepco's costs and recovery of those costs will be addressed in the normal course of Pepco's base rate cases.
- Although not the focus of this proposal, consideration must be given to utility revenue models and incentives for the resulting NWA solutions.

Pepco Demonstration

Pepco expects to execute a Non Wires Alternative demonstration project in 2021. This demonstration project, which could include DERs deployed under a variety of business and ownership models, will provide learnings about the contracting, deployment and operation of NWA.

A6.3 – GRID2.0 & D.C. CONSUMER UTILITY BOARD'S PROPOSAL FOR A PERFORMANCE INCENTIVE MECHANISMS AND NON-WIRES ALTERNATIVE MEDSIS PILOT

Summary

This is a proposal to fund a MEDSIS pilot to examine both a non-wires alternative (NWA) for DER in the area of Mount Vernon Square, DC, and an adjustment to Pepco's rate structure to support and incentivize NWA strategies. It is submitted to the MEDSIS Rates, NWA, Pilot, and Data workgroups for simultaneous consideration. The objectives are to demonstrate the ability and value of installing broad-scaled, integrated DER for managing peak load in a defined area of the distribution grid; and to evaluate the effectiveness of performance-based rate regulation to capture the value of the NWA strategy in Pepco rate design. This proposal aims to address the Mount Vernon Square element of FC1144, tie into the upcoming rate-case to be filed by Pepco in the spring, and draw upon roughly a third of the MEDSIS pilot funds to underwrite a NWA pilot. The goal of the pilot is to assemble already demonstrated DER technologies under a single management system to test interconnection and feasibility for load management on the Pepco distribution grid, concurrently evaluating the efficacy and feasibility of a phased introduction of performance incentive mechanisms to track performance of the DER management system and capture the value proposition in the utility rate structure, social welfare, and local economy.

Background

The D.C. Public Service Commission desires a more efficient way to regulate electrical service in the District, while continuing to advance the public good and maintain the financial stability of the utility. To this end, the PSC, Pepco, and stakeholders are discussing multi-year rate plans with performance incentive mechanisms (PIMs) that would adjust the net income of the utility during the period of the rate plan. A desired outcome of adopting performance metrics is to align the electric utility revenues with DC clean energy and sustainability goals. GRID2.0 asserts that the key desired change to promote DC clean energy and sustainability goals is to promote interconnection of DER and DER management systems to the distribution grid. The essential connection drawn by this proposal is to link a PIMs pilot to an integrated DER management pilot to examine the synergy between these related strategies for aligning Pepco's business plan with the Clean Energy DC plan.

By embodying many of the desired utility performance standards in a methodical way, the performance of the utility would trigger rewards and penalties in their financial return in a manner similar to the current system. It is envisioned that this strategy can be introduced incrementally and evaluated in the upcoming electric rate-case within a multi-year rate plan.

Public interest and clean energy advocates, as well as a new generation of technology industries, strongly promote DER as a means to replace fossil fuel energy sources, democratize the energy marketplace and advance ratepayer choices, and to control cost increases by improving management of peak load. This represents a significant challenge to business as usual at the utility level and there are multiple sources of resistance to progress. The DOEE/Synapse report: *Alternatives to Building a New Mt. Vernon Substation in Washington, DC* (November, 2017) was submitted to FC1130 for consideration on December 18, 2017[65]. The report characterizes how a breakthrough can be achieved when an assemblage of DER, including demand-side management and efficiency, generation, and storage can be collectively managed to balance supply and demand for power, and to shift load to manage peak demand. An approach to designing such a breakthrough begins with incentivizing change in the utility to benefit from DER proliferation and to share the expanding market with locally based business that can serve the market and drive innovation. GRID2.0 asserts that equitably sharing the benefits from DER integration into the grid between the utility and other stakeholder-investors, including ratepayers should be a collateral goal. Equally important is maintaining financial certainty during the transition so that rates remain stable and that utility investors have reasonable assurances of stable profitability.

This proposal is segmented into relevance for the MEDSIS work groups on Rates, NWA, Pilots, and Data with recommendations numbered sequentially.

Rates Work Group

b. GRID2.0 supports a multi-year rate plan for Pepco that advances evaluation of the feasibility of a performance-based regulatory (PBR) framework and that begins a transition away from total reliance on the current cost-based reimbursement strategy. Operationally the multi-year rate regulation transition requires identification of candidate performance metrics, continuation of an annual revenue "truing-up" exercise for the period of the transition, development of formulas for sharing cost-savings with ratepayers, and a method to evaluate each year's performance as a means to refining the following year's incentives/penalties such that Pepco would be increasingly incentivized to earn additional performance revenue if it achieves identified objectives. Profit would be shared with utility customers in a manner that maintains the utility's financial health as well as ensures motivation to achieve cost savings (see appendix A.

c. The PSC, Pepco and stakeholders will develop familiarity with the PBR strategy and gain experience with use of PIMs.

d. RECOMMENDATION #1: The Rates Work Group should recommend primary features of the multi-year rate regulation transition including that it (a) encourages cost savings for ratepayers, (b) sets a target revenue for Pepco, and (c) assigns PIMs to align the utility's profit motive with DC's

[65] PSC Docket FC1130 item # 223

clean energy plan - shifting utility rewards from capital outlays to measured performance outcomes.

e. RECOMMENDATION #2: The multi-year rate transition from cost-recovery to phased adoption of PBR should be an incremental process where performance metrics are measured, evaluated, and implemented based on an understood connection to outcomes, outputs and reliability. PIMs should be identified for testing that enable analysis of the effect of the NWA to the substation on the utility's revenue stream. A small self-identified team should prepare a more detailed recommendation prior to the April Rates Work Group meeting.

Because PIMs will have real financial consequences, measures with an established baseline history are essential. So existing industry standards for reliability can reliably be used in the first year of the multi-year plan. Other, less-well established measurements are best monitored in a trial period and only become active once they are proven well-founded and useful. A full suite of performance metrics should be proposed for the multi-year rate regulation transition. In the first year the rates for the utility will remain largely cost-based, with only a relatively small percentage of revenue linked to well understood performance metrics (also known as performance incentive mechanisms–PIMs; e.g. SAIDI, SAIFI). Other metrics will be measured and evaluated. Subsequent years in the multi-year rate regulation transition will lead to implementation of additional PIMs regulating a larger share of the revenue as considered prudent.

RECOMMENDATION #3: Appropriate PIMs should be negotiated before the beginning of the multi-year plan and encapsulate measurable goals that reflect the priorities throughout the service area. PIMs evaluated and prioritized by the Rates work group are appropriate. A team should be tasked to prioritize specific PIMs for the Work Group.

NWA Work Group

The NWA Work Group can propose to the Pilots Work Group a scope of work that would serve to examine and document the feasibility of DERs and associated management systems (both demand-side and DER). The scope of work could be formulated as a request for proposals suitable for funding by the MEDSIS pilot trust fund. NWA are effectively compilations of DER and allied demand-side management strategies that are formulated to address the same needs for which new "poles and wires" investments are targeted (e.g. peak load, power quality, reliability). DER technology and strategies have been extensively piloted elsewhere and much is known about their performance and reliability, even if there is limited experience in the Pepco service area. The coordination of DER and allied demand-side management strategies to function seamlessly as an alternative to poles and wires, however, is still being demonstrated and represents the grid-edge challenge to modernization as characterized by MEDSIS. For this reason, the NWA Work Group should characterize a project that fully demonstrates the ability for a NWA to successfully interface and function with the DC distribution grid.

RECOMMENDATION #4: The NWA Work Group should provide a recommendation to the Pilots Work Group to demonstrate a comprehensive package of DER and demand-side management technologies and strategies that can be managed in real-time to provide load shifting, reliability and maintenance of power quality.

The DOEE/Synapse report: *Alternatives to Building a New Mt. Vernon Substation in Washington, DC,* offers a strategic NWA to Pepco's notice of construction for a new substation at Mt. Vernon Square. Although this proposal was received by the PSC as a submission to the MEDSIS docket, it has not received thorough examination within the NWA Work Group. As a phased NWA project proposal it offers an attractive means to evaluate NWA strategies in a section of the DC grid that has been characterized by Pepco as needing additional capacity. There are arguments, pro and con for selecting a zone of the grid that is identified by Pepco as requiring immediate investment to insure reliable service. However, an immediate pilot to implement strategically identified NWA to meet forecast load can occur simultaneous with the planning of the new sub-station to mitigate unnecessary risk. Evaluation of the NWA results can help to inform the scale and capacity of the new sub-station while concurrently providing important and necessary information to all stakeholders on the potential for NWA strategies to address existing load forecasts throughout the DC grid.

Technologies and management strategies should both be demonstrated, including PV, battery storage – both before and behind the meter, demand-side management of load – automated and on-demand, and real-time orchestration of load and demand via a DER management system. It follows that participants in this proposed pilot would include a variety of energy service companies, including PV installers, building energy management contractors, energy storage suppliers, DER aggregators (potentially), and Pepco. It may also be constructive to engage local community engagement specialists who can facilitate the elements of demand-side management with ratepayers – who will in some measure be the target customers for this pilot. The capacity in which each would participate would be dependent on both an RFP and the teams who respond with proposals. Some greater specificity into geographic scope and potential customers can be gained through the NWA proposal contained in *Alternatives to Building a New Mt. Vernon Substation in Washington, DC*. It would seem prudent that Pepco would help inform identification of the pilot area and potential customers. Value streams from the pilot would potentially include load shifting, reliability and resilience, power quality (voltage, frequency, volt/var…) deferral of capital expenditure, and aggregation of assets for bid into PJM markets. The pilot will also permit examination of contractual arrangement between ESCOs and the utility.

RECOMMENDATION #5: The NWA Work Group should evaluate the year one and two recommendations contained in the DOEE/Synapse report: *Alternatives to Building a New Mt. Vernon Substation in Washington, DC,* and detail a scope of work suitable for a MEDSIS pilot. This should be done intensively by a small self-identified team and presented to the larger NWA Work Group in advance of the April meeting.

The report recommends: "… procure a portfolio of DERs that can defer the need for a new substation for 2 years, as recommended in the report. Deferring the need for a

substation for 2 years will give time to the stakeholders and the Commission to (1) closely vet the load growth forecasts, (2) evaluate cost-effective alternatives for an indefinite deferral, and (3) decide upon the procurement approaches for a DER portfolio that could potentially defer the need for a substation indefinitely." GRID2.0 believes that approximately a third of the MEDSIS trust fund will be sufficient to offset costs borne to support this project. Because benefits will be received by the ratepayers from execution of the pilot, recovery of a share of the costs by ratepayers can also be justified by the experience gained in DER management and grid modernization.

Pilots Work Group

The Pilots Work Group has endeavored to design a process for the identification of pilot project ideas and a means to develop grant RFPs, and to evaluate project proposals. As discussed in the Work Group, pilot projects may arise through the MEDSIS work group process itself, and these projects can be fast-tracked into the RFP granting process.

RECOMMENDATION #6: The Pilots Work Group should receive the pilot project recommendation of the NWA Work Group and use this as a basis for recommending that a separate parallel track and associated award be fast-tracked for a single project to implement a NWA to serve the area forecast to be serviced by the newly proposed Mt. Vernon Sq. sub-station.

Data Work Group

The Data Work Group is tasked with integrating results and recommendations from the other MEDSIS work groups in addition to considering data demands for grid modernization. Appropriately, consideration of the NWA alternative should integrate objectives from across the work groups as relevant. Data requirements from the proposal also need to be developed to ensure that PIMs can be reliably monitored.

RECOMMENDATION #7: The Data Work Group should evaluate the proposal and seek to incorporate suitable identified objectives from other work groups as appropriate, and work to support and assist the identification of PIMs for which data is available to measure and monitor.

Appendix A - Discussion of Performance Incentive Mechanisms

f. Through past experience it has been learned that successful PIMs must have certain properties. These include 1) robust numerical measurement, 2) reflecting a valued public outcome, that 3) the utility has responsibility for providing.

Robust numerical measurement: A good PIM is based on a formula where the input number(s) are well-defined and unbiased. For instance there are industry-standard service reliability measures that are commonly used to formulate PIMs. It is important

that each numerical measure be statistically meaningful, that it can be audited, and that the utility can monitor its performance against the measure throughout the year.

Valued public outcome: Reliability is just one such desired utility outcome. Safety, security, and customer service are other examples. All these typical standards can be compared with industy-equivalent performance, which reduces the possibility of setting unachievably high expectations.

Utility responsibility: The utility will have a clear set of PIM responsibilities and has control over achieving these. Since often there are trade-offs between utility investments in these pursuits, the PIMs must be designed and modeled to ensure that unintended perverse outcomes do not occur.

Specific performance incentive mechanisms can be rewards, penalties, or both.

For a measure where an acceptable high level of performance is already demonstrated, the PIM can be penalty-only. For a measure where there is an existing level of performance that is known, but the valued public outcome is for better performance, then the PIM can reward for higher performance and penalty for slippage (these can be asymmetric if desired.) For a measure of a new valued public outcome starting from a very low baseline, the PIM can be reward-only.

Generally the total PIM reward/penalty amount is restricted to a range that does not fundamentally upset financial stability of the utility or overly rewards the utility if the PIMs prove easy to meet. Enough utility profit is maintained to prevent major panic on Wall Street if the PIMs result in no net reward. And the maximum net PIM reward is capped to prevent undue euphoria on the exchange. For these reasons the total amount of PIM adjustments to utility profit is usually set to a band around the existing profit level. This plus/minus profit cap is measured in basis-points (100 basis-points = 1%). The range must be large enough to provide sufficient incentive to the utility to pursue these public goals.

Each of the PIMs can have a different basis-point weight, depending on the relative public valuation of that PIM. The goal for each year in the multi-year plan is set at the beginning of the plan and can escalate over the period of the plan. A PIM can have a dead-band around the goal value, for which there is no reward or penalty, and then a simple equation assigning basis-points up to the maximum value for that PIM.

PIM Goals

Moving away from accounting: What are our common objectives about the electrical services we received from Pepco?

The list includes traditional things like electrical safety, reliability, affordability, and customer-focus. However modern times now add resiliency, security, efficiency, and the environment to the list. This list is undoubtedly incomplete and will grow. The challenge is to establish one or more metrics that can be used as the basis of a PIM for each of these. Fortunately there are examples of good metrics for the traditional goals

and now for some of the modern goals. There are missing parts to this puzzle that will require trial evaluations.

The next challenge is to establish the maximum net basis-point range, to set the relative weights of the various PIMs, and whether each is one-sided or not.

The final challenge is to set each PIM target and dead-band. All of these will need to be modeled based on existing data about utility performance, so the effect can be compared with the outcome of previous rate-cases, where the settlement process rewarded or penalized Pepco performance on the traditional measures.

DC PIM Models for Pepco - Traditional

The traditional societal goals of safety, reliability, and customer-response are measured and reported by Pepco to the PSC on a regular basis. These are natural PIM metrics. Affordability is a more difficult case.

On safety and reliability in the last two reporting periods, Pepco's performance is considered good by comparison to other utilities. These might be set up with penalty-only PIMs that encourage Pepco to maintain the current high levels. If comparable utilities demonstrate improved safety and reliability levels in the future, then this PIM would be changed to a symmetric model that would encourage improvement.

On customer-response, there is always room for improvement. This should be a symmetric model.

On affordability, a PIM is complicated since rates and fees are set by the PSC and various external programs to reduce the energy burden exist. However Pepco does have a lot of indirect control over affordability through their internal costs and their capital project investments. This may be a good case for several trial PIM metrics to be evaluated in the first multi-year plan.

DC PIM Models for Pepco – Modern

Resiliency, security, efficiency, and environment must be included. Trial PIM metrics must be tested in many cases since the baseline is not well-established.

However, for resiliency and environment there is some existing data that might naturally lead to PIMs for these goals. Pepco reports the time it takes for it to evaluate and approve Level 1, 2, and 3 interconnections of distributed energy resources in the District. An example of Level 1 is residential roof-top solar and Pepco has made great strides in shortening this whole process. This is an example of a symmetric PIM that could be implemented immediately

Level 2 and 3 interconnections apply to larger projects. Those include big dumb buildings that do not have potential generation, storage, or demand-response. However a District goal is to greatly increase the numbers that do have these modern systems. A PIM for Level 2 and 3 interconnections that meet this criterion could be proposed for a trial period.

For efficiency, a hugely important PIM could be grid-utilization efficiency. Our existing investment in the DC grid capacity is rarely used near its potential, yet we keep adding capacity. There are many technical and economic methods to improve grid-utilization efficiency at lower rate-payer expenditure. A reward-only PIM for employing these could be tested.

A6.4 - D.C. CLIMATE ACTION'S PROPOSAL FOR PUBLIC SERVICE COMMISSION TO EXPLORE POTENTIAL FOR COMMERCIAL RATE DESIGN TO INCENTIVIZE PEAK LOAD SHIFTING AND DEMAND REDUCTION

MEDSIS Working Group 3

Recommendation
For Public Service Commission to
Explore Potential for Commercial Rate Design to
Incentivize Peak Load Shifting
And Demand Reduction

DC Climate Action
March 27, 2019
(Post meeting update)

Commercial buildings overall are responsible for over half of the District of Columbia's greenhouse gas emissions. To meet the District's statutory clean energy mandates, one area for further exploration is the potential for Commercial building rate design to reduce peak load and energy demand.

Supply (Generation) Side of Commercial Rates:

The default Standard Offer of Service rates in place for four classes of *large commercial* customers (GT-LV, MGT-LV, GT-3A, GT-3B)[66] are time-based for generation rates. They include "On Peak", "Intermediate" and "Off Peak" rates. Currently, two of these four classes (GT LV and MGT LV[67]) have identical "time-metered" rates that are approximately 12% higher at peak than at "intermediate" rate periods in the warm season (June-October), which might incentivize customers to shift their usage from peak times. The high voltage large commercial customer class (GT 3B), however, has no differentiation between peak, intermediate and off peak rates[68], thus no peak usage reduction incentive from this time metered rate structure. The Public Service Commission ("Commission") would not have much leverage in requiring more robust pricing intervals between usage times for these time-metered generation rates because

[66] Low Voltage Service Schedules "GT LV" and "MGT LV", Primary Service Schedule "GT 3A" and High Voltage Service Schedule "GT 3B".

[67] https://www.pepco.com/MyAccount/MyBillUsage/Documents/8.DC%20Rates%20Update%203-5-2019%20MGT%20LV.pdf, https://www.pepco.com/MyAccount/MyBillUsage/Documents/7.DC%20Rates%20Update%203-5-2019%20GT%20LV.pdf

[68] https://www.pepco.com/MyAccount/MyBillUsage/Documents/10.DC%20Rates%20Update%20%203-5-2019%20%20GT%203B.pdf

customers could switch to competitive rates from unregulated third-party energy providers who rarely include price incentives for reducing usage at peak load times.

In the case of the GT 3A "Primary Service" time-metered customer class, rates are currently lower at peak than at intermediate times in the warm months (by approximately 7%)[69], thus incentivizing peak time use. Such rate design does not align with the District's new statutory mandate for clean energy and carbon emissions reduction. We urge the Commission to consider ways to align time-metered rates for this class more with the District's clean energy goals.

Distribution Side of Commercial rates:

We urge the Commission to explore the following:

- incentivizing peak load shifting by commercial building classes through distribution rates (including time-variant), given that these rates apply to all commercial customer rate classes, whether electricity is supplied through the "Standard Offer of Service" or via third-party providers;
- how time of use distribution rates might incentivize greater use of batteries by commercial buildings.

Such exploration would need to be made within the context of a broader discussion of the adjustment of the rate differences between commercial and residential customers while maintaining just and reasonable rates for residential customers. It is also important that new rate designs not inadvertently disincentivize the electrification of heating and transport, a crucial pathway to meeting DC's carbon reduction mandate.

The Commission may also wish to take into account how such rate incentives would interact with the new Building Energy Performance Standards for large buildings under the new Clean Energy DC Omnibus Amendment Act, either positively or negatively.

A parallel rate exploration could apply to gas rates with respect to winter peak demand.

[69] https://www.pepco.com/MyAccount/MyBillUsage/Documents/9.DC%20Rates%20Update%203-5-2019%20GT%203A.pdf

A6.5 – DOEE AND URBAN INGENUITIY'S A NEW APPROACH TO SOLAR SATURATION – BRIEFING TO MEDSIS NWA WG

A NEW APPROACH TO SOLAR SATURATION

Briefing to MEDSIS NWA WG

MARCH 19, 2019

URBAN INGENUITY

Agenda

1. Challenges & Existing Solutions
2. Project Parameters / Design Approach
3. Current Design
4. Next Steps

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CHALLENGES & EXISTING SOLUTIONS

Policy Context

Is Stand-Alone Solar a Feasible NWA?

Limitations on Meeting Peak Grid Demand:

- Maximum output doesn't match time of peak load (especially for evening use in residential neighborhoods)
- Solar deployments are (so far) diffuse, not concentrated into load pockets that need NWAs
- Concentrating solar installations violates hosting capacity

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Will Hosting Capacity Limit Solar Deployment?

Context: Clean Energy DC Plan / Clean Energy DC Omnibus Act

- 100% RPS by 2032 with 10% local solar carve-out
- Roughly 1,000 GWh / year solar or ~800 MW installed solar capacity

Technical Limitations Force Costly Grid Upgrades:

- Individual feeders can only accommodate distributed generation equal to roughly 15% of their peak capacity.
- For single-family, translates to a cap of 10% of homes
- Too much solar (today) leads to myriad grid problems:
  - Overvoltage, flicker, malfunctioning voltage regulators
  - Reverse power flow, transients
  - System protection failures, violation of fault current limits
  - Inadvertent islanding, power relay malfunctions

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The Challenge of Grid Vulnerability

Context: Increasing Threat Level

- Climate related – storms, heat waves, etc.
- Intentional attacks – cyber, EMP, and physical

What is the Role for Solar Microgrids?

- Potential to provide for critical infrastructure protections, government continuity etc
- Strong opportunity to protect vulnerable demographics, low-resiliency neighborhoods, advance environmental justice
- Isolated solar and solar without storage *will not* provide resiliency benefits

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Potential Solution for *Solar Saturation*

High-Density Deployment with Full Resiliency

- 80% or more of residences with rooftop solar
- No limitations from hosting capacity issues
- Integrated storage, sectionalized grid, fully islandable
- Leverage *existing* utility distribution infrastructure

Lowest-Cost Solution

- Solar deployment savings from economies of scale
- Storage made economical by NWA incentives and / or resiliency investment
- No utility expense for increasing hosting capacity = mitigated need for wires investment

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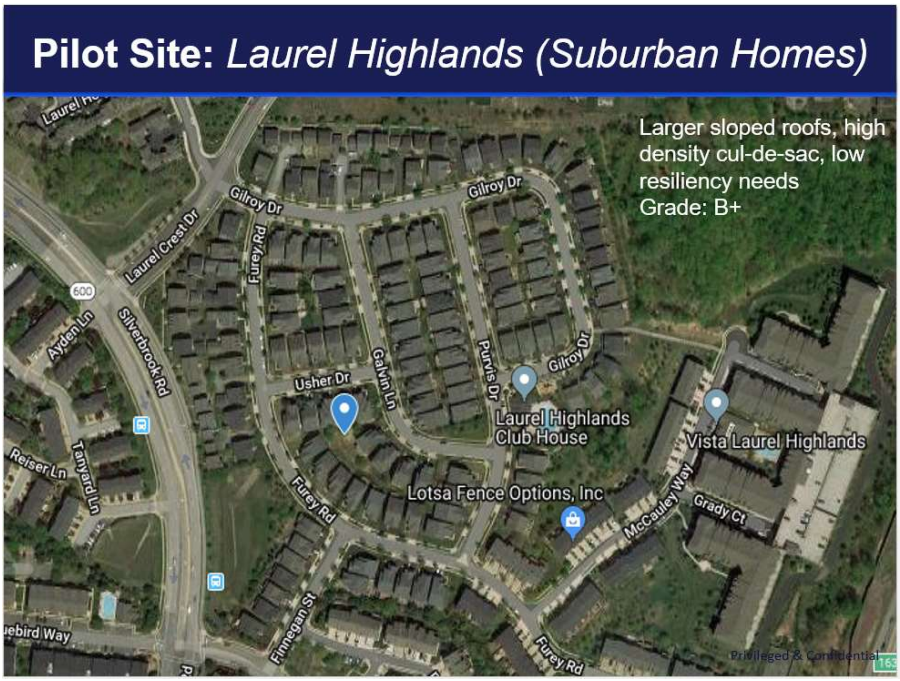
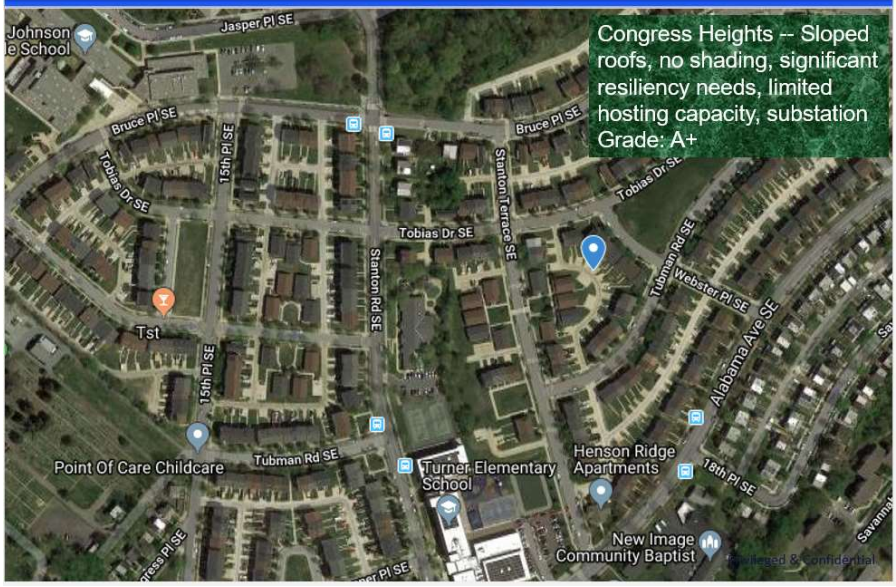
PROJECT PARAMETERS & DESIGN APPROACH

Site Selection and Design Criteria


Pilot Site: Woodley Park (Row Houses)
South facing flat roofs, minimal shading, lower resiliency needs
Grade: B-, but…
Carlton Condominium
WISH Woodley Park
Woodley Park Place Condominium
Garfield St NW
Connecticut Ave NW
Woodley Pl NW
Cathedral Ave NW
Rock Creek Park Trails
Rock Creek
Doubletake Images
Zipcar
Woodley Park Guest House
2701 Connecticut
Clark Construction
Woodley Rd NW
Hot N Juicy Crawfish
Wardman Tower
Manhattan Market


Pilot Site: Laurel Highlands (Suburban Homes)
Larger sloped roofs, high density cul-de-sac, low resiliency needs
Grade: B+
Gilroy Dr
Laurel Crest Dr
Furey Rd
Aydan Ln
Silverbrook Rd
Usher Dr
Galvin Ln
Purris Dr
Laurel Highlands Club House
Vista Laurel Highlands
Reiser Ln
Tanyard Ln
Lotsa Fence Options, Inc
McCauley Way
Grady Ct
Finnegan St

Pilot Site: *Henson Ridge (Affordable Housing)*



Project Parameters: *Criteria for Suitability*

Economics Relies on Scale and on Existing Incentives

- Rooftop solar already has attractive economics
- Removing hosting capacity issues improves economies of scale
- Achieves threshold size to justify storage and controller expense
- Re-use of existing utility distribution infrastructure lowers cost

Opt-Out Program Design

- Expect 80% participation, similar to Community Aggregation
- Needed for resiliency investment to be effective
- Further economic savings for solar installation (25%?) from lower soft costs, customer acquisition, mobilization

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CURRENT DESIGN

Moving from Preliminary Concept to Design & Development

Status Update: *Design Philosophy*

Design Package Underway

- First draft of drawings complete
- Narrative basis-of-design in progress
- Pilot Projects for later phase

Approach: New Configuration of Off-the-Shelf Components

- Generic, but customizable for specific sites
- Open source design, but utilizing existing commercial products
- Innovative, but leveraging pieces that already work
- More than 95% of desired capabilities inherent in ordinary components

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Off-the-Shelf Panels & Advanced Inverters

Panasonic

N330/N325 HIT

330W/325W

High Efficiency + High Performance at High Temperatures = High Power Generation

Smart Grid Ready

- Complies with fixed power factor, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

ENPHASE

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Off-the-Shelf: Comms, DR, Meters, Load-shed Engineered: Storage, Controller

IPERC GridMaster® Microgrid Control System

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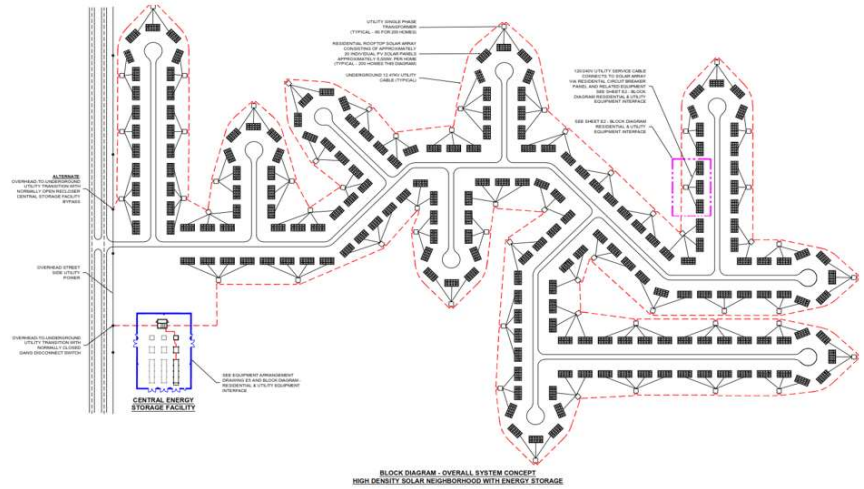
Sample Site Plan



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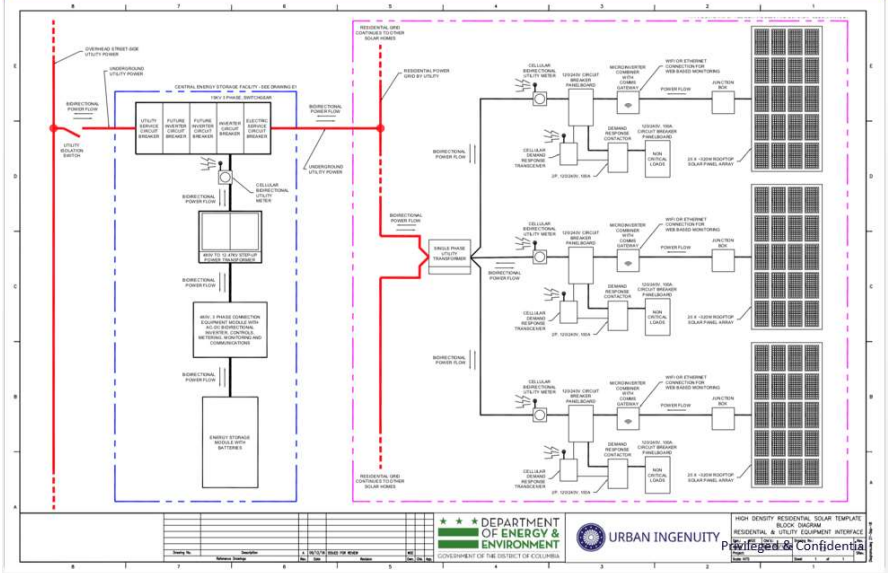
Overview: Block Diagram



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NEXT STEPS

Toward Implementation

Next Steps & Discussion

Next Steps:

- Continue design work, Design Basis documentation, case studies
- Identify ***Potential Pilots***: increasing hosting capacity, NWAs

Discussion Topics:

- How does Solar Saturation fit with NWAs? What are the contract mechanisms, including risk, performance, and operations?
- What is the appropriate role of the utility? For the customer? For project developers? Are there privacy concerns for data sharing?
- What is the best pathway to a demonstration implementation pilot?

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Thank you!

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A6.6 – SUNRUN'S "BRING-YOUR-OWN DEVICE" (BYOD) PEAK DEMAND MANAGEMENT PROPOSAL: MEETING UTILITY AND SYSTEM NEEDS WITH RESIDENTIAL SOLAR+STORAGE

A "Bring Your Own Device" (BYOD) battery program can be summarized as a $/kw-month payment for load reduction and injection by residential batteries, generally developed and enrolled by aggregators in partnership with residential customers. Load reduction and injection can be calibrated according to the value that an aggregator is contracted to provide to a utility, such as capacity market or transmission peak. A base value for load reduction can be established for the service territory as a whole, with the potential for additional values to be layered on for location-specific performance, such as a NWA. This is a straightforward way to promote solar+storage integration across a utility territory and unlock the value of DERs without getting into the complexity of rate design issues.

BYOD programs are also beneficial in that they do not rely upon rate-based assets and therefore avoid the risk of utility-owned stranded assets. They support the development of a competitive and self-sustaining storage market due to their open and transparent nature. These programs encourage firms to enter new markets and make diverse financing options available to customers. Finally, the upfront or performance payments can substantially reduce the cost of batteries, expanding access to clean and resilient power further down the income spectrum.

Key Elements of a BYOD Program

Customers participating in the BYOD program will install a compatible battery system. Once installed, they will follow enrollment instructions individually or through an aggregator. The enrollment will include a verification process that confirms the device can be utilized in the program platform. Once integration into the platform is confirmed, the participating customer or a designated aggregator will begin receiving participation payments in exchange for dispatching the device, which generates value for all customers. For customers not participating through an aggregator, the participation payment could be provided as a bill credit. For customers that enroll with an aggregator, the participation payment will remit as a direct payment to the aggregator who will manage customers' batteries and the customer value proposition.

The utility will collaborate with participating aggregators to explore options that allow customers to participate on different levels and essentially "pay for performance" when they provide services that benefit the utility system and all ratepayers.

The program would include the following characteristics:

1. Participants and aggregators will use non-utility owned energy storage assets to participate in the program.
2. Direct control of the DER remains with the system owner or another party they designate for this purpose, such as an aggregator entity.

3. Customers with solar-paired energy storage are able to participate without limits or any additional conditions beyond those that would otherwise apply.
4. Program payments may be distributed directly to an aggregator entity, either at the election of an individual participating customer or via a direct services agreement between the utility and the aggregator (e.g., for a specific amount of capacity).
5. Payment rates are established under a standardized minimum fixed rate system for the duration of participation, subject to performance rules consistent with the use case, punitive measures for non-performance, and potential enhanced payments for performance.
6. Program benefits and risks are shared in a systematic, equitable manner between participants and non-participants.
7. Customers may opt-out of the program at any time via coordination with any aggregator that they have designated as the system operator.
8. Customers shall not be forced to depart from their current rate schedule or net metering agreement, and the program shall be a rider that is additional to the underlying rate.

Examples of Residential BYOD Programs

1. Green Mountain Power's Residential Storage Program

Green Mountain Power (GMP) has a BYOD program in which customers who adopt residential storage can opt to provide GMP with dispatch rights for monthly peak shaving. Customers can select upfront compensation ($850 per kW pledged for performance) or ongoing payments.[70]

The program is open to customers across the GMP service territory. This enables GMP to access battery capacity and bring a battery offering to its customers in partnership with solar/storage providers, without taking on the responsibility to manage the deployment of the resources. Solar/storage providers are able to customize offers to suit customer preferences.

2. PSEG Long Island's Behind-the-Meter Energy Storage with Solar Program

In its Utility 2.0 Long Range Plan filed in June 2018,[71] PSEG Long Island proposed to enhance its Super Savers program with the introduction of a Standard Offer $/kW-year payment for qualified capacity savings. PSEG Long Island will offer a payment to third party aggregators, selected via a qualification process that will allow PSEG Long Island

[70] https://greenmountainpower.com/bring-your-own-device/

[71] https://www.lipower.org/wp-content/uploads/2018/06/2018-06-29-PSEG-LI-Utility-2.0-2018-Annual-Update.pdf

to remotely control customers' energy storage systems to reduce load during called events. The third-party aggregator will enter agreements with PSEG Long Island and the customer that authorizes the terms and conditions of program participation. PSEG Long Island will compensate the third-party aggregator on a pay-for-performance basis for load reduction, with the expectation that customers will also receive a rebate or cost savings, either through a portion of the rebate from PSEG Long Island transferred to them, and/or an upfront discount from the aggregator for the battery installation. This structure provides space for the storage market to innovate and implement solutions that will achieve maximum program participation.

While contractors will lead customer engagement, the program includes a co-marketing component in which PSEG Long Island will encourage customer battery sales to complement solar installations. This will reduce customer acquisition and consumer prices. PSEG Long Island plans to partner with equipment manufacturers and contractors on collateral material to support and drive customer participation, including targeted direct mail outreach to potential energy storage prospects, to drive interest and generate contractor leads.

3. Massachusetts' Statewide BYOD Program

The Massachusetts Department of Public Utilities incorporated energy storage into the state's 2019-2021 energy efficiency plan and approved a statewide BYOD program for peak reduction, finding that the BYOD program passed important benefit-cost analyses.[72] The state's energy efficiency budget will provide funding for payments to participating aggregators and customers. The new program follows an evolution in thinking away from annual kWh reductions toward ways to reduce system peaks, given that peak hours represent the costliest and dirtiest generation periods on the grid. BYOD programs are uniquely structured to help lower peak demand during these critical hours.

[72] https://www.cleanegroup.org/ceg-resources/resource/energy-storage-the-new-efficiency/

A.7 MEDSIS Documents In Higherlogic

The public can obtain access to the documents listed below by visiting www.dcgridmod.com and registering for any one of the MEDSIS working groups. Once registered, an email will be sent with information on how to access the repository.

WG1: DATA INFORMATION ACCESS AND ALIGNMENT

- Smart Electric Power Alliance (SEPA). Aug, 2018. WG1: DIAA August Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Sep, 2018. WG1: DIAA September Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Oct, 2018. WG1: DIAA October Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. WG1: DIAA November Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. WG1: DIAA January Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Mar, 2019. WG1: DIAA March Meeting Presentation. Facilitator Presentation
- United States Department of Energy (DOE). Sep, 2018. Considerations for Grid Modernization. Presentation
- Potomac Electric Power Company (Pepco). Sep, 2018. Assessment of Pepco's System and System Constraints. Presentation
- Smart Electric Power Alliance (SEPA). Oct, 2018. WG1: DIAA Mapping Measurable Objectives to the MEDSIS Guiding Principles. Stakeholder Exercise
- Smart Electric Power Alliance (SEPA). Nov, 2018. MEDSIS Road mapping and Guiding Principles v1.0. Summary Document
- Green Business Certification Inc. (GBCI). Nov, 2018. Performing Excellence in Electricity Renewable (PEER) Rating System. Report
- Green Business Certification Inc. (GBCI). Nov, 2018. Performing Excellence in Electricity Renewable (PEER) Scorecard. Project Checklist
- Smart Electric Power Alliance (SEPA). Nov, 2018. WG1: DIAA November Meeting Pre-Reading Materials. Presentation
- Maryland Public Service Commission. Nov, 2018. PC44 Rule Making on Distribution and Use of Consumer Interval Data. Ruling Request
- Potomac Electric Power Company (Pepco) & Exelon Utilities. Nov, 2018. Matrix of Commitments from the Pepco – Exelon Merger. Tracking Matrix
- District of Columbia Public Service Commission (DCPSC). Jan, 2019. Formal Case 1149 Order No. 19741. Commission Order
- Potomac Electric Power Company (Pepco). Jan, 2019. Senior and Disabled Resident Rate Credit Implementation Plan. Report
- Smart Electric Power Alliance (SEPA). Jan, 2019. MEDSIS Road mapping and Guiding Principles v2.0. Summary Document

- Greentel Group. Jan, 2019. A Data-Driven Roadmap to Accelerate Grid Modernization. Presentation
- Council of the District of Columbia. Jan, 2019. D.C. Law Library Code of the District of Columbia: Subchapter II. Freedom of Information – § 2-539. Definitions. Document
- Coalition for a Resilient D.C. (CRDC). Feb, 2019. MEDSIS DIAA Working Group: System-Level Data Requests. Stakeholder Submission
- D.C. Climate Action (DCCA). Feb, 2019. Revised System-Level Data Requests & Justification. Stakeholder Submission
- Sunrun. Feb, 2019. Locational Grid Services: Supporting Data and Best Practices. Stakeholder Submission
- Potomac Electric Power Company (Pepco). March, 2019. Pepco Response to System Level Data Requests and Justifications (Revision 1). Stakeholder Response
- Potomac Electric Power Company (Pepco). March, 2019. Pepco Response to Grid2.0 Proposal. Stakeholder Response

WG2: NON-WIRES ALTERNATIVES

- Smart Electric Power Alliance (SEPA). Oct, 2018. WG2: NWA October Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. WG2: NWA November Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Dec, 2018. WG2: NWA December Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. WG2: NWA January Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Feb, 2019. WG2: NWA February Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Mar, 2019. WG2: NWA March Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. WG2: MWA November Meeting Pre-Reading Materials. Presentation
- Potomac Electric Power Company (Pepco). Nov, 2018. Recommended NWA Charter Revision. Document
- Navigant Research. Nov, 2018. Non-wires Alternatives (NWA) Overview. Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. Non-wires Alternatives: Case Studies from Leading U.S. Projects. Report
- Smart Electric Power Alliance (SEPA). Nov, 2018. Version 1.0 WG2 NWA Definition, Classification, Technologies and Goals. Document
- Grid Modernization Laboratory Consortium (GMLC). Dec, 2018. PUC Distribution Planning Practices. Presentation
- New Energy Advisors. Dec, 2018. Integrated Distribution Planning. Presentation

- Smart Electric Power Alliance (SEPA). Dec, 2018. Version 1.2 WG2 NWA Definition, Classification, Technologies and Goals. Document
- Con Edison. Dec, 2018. Con Edison's Non Wires Solutions. Presentation
- California Public Utilities Commission (CPUC). Dec, 2018. Instituting Rulemaking Regarding Policies, Procedures and rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769. Commission Order
- Advanced Energy Economy Institute (AEE). Dec, 2018. Utility Earnings in a Service-Oriented World. Report
- Rocky Mountain Institute (RMI). Dec, 2018. The Non-wires Solutions Implementation Playbook. Report
- Smart Electric Power Alliance (SEPA). Dec, 2018. Version 1.3 WG2 NWA Definition, Classification, Technologies and Goals. Document
- Grid2.0. Jan, 2019. Components of Distribution Planning. Stakeholder Response
- Potomac Electric Power Company (Pepco). Jan, 2019. Pepco Response to NWA Gap Analysis. Stakeholder Response
- Potomac Electric Power Company (Pepco). Jan, 2019. Pepco's Proposed Stakeholder-Informed DSP and NWA Consideration Process. Draft Proposal
- Potomac Electric Power Company (Pepco). Jan, 2019. Pepco's Proposed Stakeholder-Informed DSP and NWA Consideration Process Visual. Proposal Graphic
- Potomac Electric Power Company (Pepco). Jan, 2019. Pepco's Proposed Stakeholder-Informed DSP and NWA Consideration Process. Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. Draft 2.0 Distribution System Planning Gap Analysis and Draft Recommendations. Document
- Smart Electric Power Alliance (SEPA). Jan, 2019. Working Group Draft Advanced Inverter Definition. Document
- Energy Storage Association (ESA). Feb, 2019. Storage Ownership & Competition. Presentation
- Potomac Electric Power Company (Pepco). Feb, 2019. Version 2.0: Pepco's Proposed Stakeholder-Informed DSP and NWA Consideration Process. Draft Proposal
- Potomac Electric Power Company (Pepco). Feb, 2019. Version2.0: Pepco's Proposed Stakeholder-Informed DSP and NWA Consideration Process Visual. Proposal Graphic
- Grid2.0. March, 2019. Performance Incentive Mechanisms and Non-Wires Alternatives MEDSIS Pilot. Draft Proposal
- Potomac Electric Power Company (Pepco). March, 2019. Pepco Response to Grid2.0 Proposal. Stakeholder Response
- Smart Electric Power Alliance (SEPA). March, 2019. DER Ownership Draft Recommendations. Document

WG3: RATE DESIGN

- Smart Electric Power Alliance (SEPA). Aug, 2018. WG3: Future Rate Design August Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Sep, 2018. WG3: Future Rate Design September Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Oct, 2018. WG3: Future Rate Design October Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. WG3: Future Rate Design November Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Dec, 2018. WG3: Future Rate Design December Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. WG3: Future Rate Design January Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Feb, 2019. WG3: Future Rate Design February Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Mar, 2018. WG3: Future Rate Design March Meeting Presentation. Facilitator Presentation
- The Brattle Group. Sep, 2018. Rate Design in a High DER Environment. Presentation
- National Association of Regulatory Utility Commissioners. Oct, 2018. Distributed Energy Resources Rate Design and Compensation. Report
- Smart Electric Power Alliance (SEPA). Oct, 2018. Alternative Rate Design Survey Results. Document
- Potomac Electric Power Company (Pepco). Oct, 2018. Pepco – Current Rate Structure. Presentation
- Regulatory Assistance Project (RAP). Oct, 2018. Performance-Based Regulation: Modernizing the Energy Delivery System for Increased Sustainability. Presentation
- District of Columbia Public Service Commission (DCPSC). Nov, 2018. DCPSC Response to DCCA Question on TOU Rates. Response
- Potomac Electric Power Company (Pepco). Nov, 2018. Pepco – Current Rate Structure – Expanded Version. Presentation
- Future Utility Regulation. Nov, 2018. Performance-Based Regulation in a High Distributed Energy Resources Future. Report
- Potomac Electric Power Company (Pepco). Nov, 2018. Performance Based Regulation Stakeholder Workshop #2. Presentation
- Minnesota Center for Energy and Environment (MNCEE). Nov, 2018. e21 Initiative Phase II Report on Implementing a Framework for a 21st Century Electric System in Minnesota. Report
- Hawaii Public Utilities Commission (HIPUC). Nov, 2018. Assessing the Existing Regulatory Framework in Hawaii. Report
- National Grid. Nov, 2018. Investigation as to the Propriety of Proposed Tariff Changes. Compliance Filing

- Michigan Public Service Commission. Nov, 2018. Report on the Study of Performance-Based Regulation. Report
- Utility Dive. Nov, 2018. How New York is Incentivizing Utilities to interconnect DERs Under REV. News Article
- Con Edison. Nov, 2018. Reforming the Energy Vision (REV) in New York. Presentation
- Rhode Island Public Utilities Commission (RIPUC). Nov, 2018. Performance Incentives and Regulation in Rhode Island's Power Sector. Presentation
- Potomac Electric Power Company (Pepco) & Exelon Utilities. Nov, 2018. Matrix of Commitments from the Pepco – Exelon Merger. Tracking Matrix
- Potomac Electric Power Company (Pepco). Nov, 2018. Power Quality Report under FC982. Report
- Advanced Energy Economy (AEE), Rocky Mountain Institute (RMI), and America's Power Plan (APP). Dec, 2018. Case Study: Navigating Utility Business Model Reform. Report
- State of New York Public Service Commission (NYPSC). Dec, 2018. 2018 Outcome-Based EAM Collaborative Report. Report
- D.C. Sustainable Energy Utility. Dec, 2018. Performance Benchmarks. Report
- Advanced Energy Economy (AEE), Rocky Mountain Institute (RMI), and America's Power Plan (APP). Dec, 2018. Navigating Utility Business Model Reform: A Practical Guide to Regulatory Design. Report
- Potomac Electric Power Company (Pepco). Dec, 2018. Existing Pepco DC Performance Metrics / Penalties. Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. Revised PBR Survey Results. Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. Rate Design PIM Mapping Exercise. Presentation
- Potomac Electric Power Company (Pepco). Jan, 2019. Pepco PIM Mapping Exercise Response. Stakeholder Response
- Potomac Electric Power Company (Pepco). Jan, 2019. PHI – Experience with Innovative Rate Design. Presentation
- Elevate Energy. Jan, 2019. Illinois' Hourly Pricing Programs. Presentation
- Smart Electric Power Alliance (SEPA). Feb, 2019. IOU Distribution Only – Deregulated Market – Utilities. Spreadsheet
- PJM Interconnection. Feb, 2019. DC Top 100 Hour Peak Shaving: Energy Market Benefit Simulation. Report
- Ameren Illinois Company. Feb, 2019. 2017 RTP Program Report. Report
- Commonwealth Edison (ComEd). Feb, 2019. 2017 RTP Program Report – Part 1. Report
- Commonwealth Edison (ComEd). Feb, 2019. 2017 RTP Program Report – Part 2. Report
- Smart Electric Power Alliance (SEPA). Feb, 2019. PIM Mapping – Consolidated Input – Draft. Document

- D.C. Climate Action (DCCA). Feb, 2019. Smart Inverter Pilot Summary. Document
- Potomac Electric Power Company (Pepco). Feb, 2019. Pepco Recommendation to MEDSIS Rate Design Working Group: A Path Forward for Dynamic Pricing. Proposal
- Quanta. Mar, 2019. Locational Value of DER. Presentation
- Potomac Electric Power Company (Pepco). Mar, 2019. Pepco Response to Grid2.0 Proposal. Stakeholder Response
- D.C. Climate Action (DCCA). Mar, 2019. Recommendation for Public Service Commission to Explore Potential Commercial Rate Design to Incentivize Peak Load Shifting and Demand Reduction. Proposal
- D.C. Department of Energy and Environment (DOEE). Mar, 2019. Locational Value of DER Recommendation. Proposal

WG4: CUSTOMER IMPACT

- Smart Electric Power Alliance (SEPA). Aug, 2018. *WG4: Customer Impact August Meeting Presentation.* Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Sep, 2018. *WG4: Customer Impact September Meeting Presentation.* Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Oct, 2018. *WG4: Customer Impact October Meeting Presentation.* Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. *WG4: Customer Impact November Meeting Presentation.* Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Dec, 2018. *WG4: Customer Impact December Meeting Presentation.* Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. *WG4: Customer Impact January Meeting Presentation.* Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Feb, 2019. *WG4: Customer Impact February Meeting Presentation.* Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Mar, 2019. *WG4: Customer Impact March Meeting Presentation.* Facilitator Presentation
- New York Department of Public Service (NYDPS). Sep, 2018. *Coordinating Benefits and Impacts of Distributed Energy Resources.* Presentation
- D.C. Office of the Peoples Counsel (OPC). Oct, 2018. *Customer Impact & Engagement.* Presentation
- Oracle. Oct, 2018. *Delighting Customers with Grid Modernization.* Presentation
- Arcadia Power. Oct, 2018. *Customer Education and Engagement.* Presentation
- Potomac Electric Power Company (Pepco). Oct, 2018. *Pepco's Customer Engagement.* Presentation
- American Coalition of Competitive Energy Suppliers (ACCES). Oct, 2018. *DC MEDSIS Initiative: Working Group #4 – Customer Impact.* Presentation

- American Coalition of Competitive Energy Suppliers (ACCES). Nov, 2018. *The Power of Choice: Consumer Preferences on Energy Choice Florida and Ohio.* Document
- American Coalition of Competitive Energy Suppliers (ACCES). Nov, 2018. *Your Energy, Your Choice: How to Shop for a Competitive energy Supplier.* Presentation
- American Coalition of Competitive Energy Suppliers (ACCES). Nov, 2018. *How to Analyze an Offer.* Info Graphic
- American Coalition of Competitive Energy Suppliers (ACCES). Nov, 2018. *California Customer Choice: An Evaluation of Regulatory Framework Options for an Evolving Electric Market.* Response to CPUC Request for Comment
- Potomac Electric Power Company (Pepco). Nov, 2018. *Pepco Interconnection Process.* Website Link
- Utility Dive. Nov, 2018. *Three ways Utilities can Better Engage Low-income customers.* New Article
- New York Public Service Commission (NYPSC). Nov, 2018. *PSC Expands Opportunities for Low-Income Households to Participate in Community Distributed Generation.* Press Release
- District of Columbia Public Service Commission (DCPSC). Nov, 2018. *Formal Case No. 1148 Order No. 19428.* Order
- District of Columbia Public Service Commission (DCPSC). Nov, 2018. *Utility Discount Program for Low-Income Households.* Fact Sheet
- D.C. Department of Energy and Environment (DOEE). Nov, 2018. *Affordability, Efficiency, & Solar.* Presentation
- D.C. Sustainable Energy Utility (DCSEU). Nov, 2018. *What is the Sustainable Energy Utility?* Presentation
- Maryland Public Service Commission (MDPSC). Nov, 2018. *Request for Rule Making in Public Conference 44.* Rule Making
- Nest. Nov, 2018. *Nest Power Project.* Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. *Customer Data Protections in the District of Columbia.* Document
- Mission: Data. Dec, 2018. *Energy Data: Unlocking Innovation with Smart Policy.* Report
- District of Columbia Public Service Commission (DCPSC). Dec, 2018. *DCPSC Approves Experimental Electricity Rate Credit to Help DC Seniors and Disabled Residents.* Pres Release
- Applied Public Policy Research Institute for Study and Evaluation (APPRISE). Dec, 2018. *District of Columbia LIHEAP Energy Burden Analysis.* Report
- Smart Electric Power Alliance (SEPA). Dec, 2018. *Key Questions Breakdown for Low-Income Consideration.* Activity Results
- California Public Utility Commission (CPUC). Dec, 2018. *Customer Data Access Committee Whitepaper.* Document

- District of Columbia Public Service Commission (DCPSC). Dec, 2018. Formal Case No. 1098 Order No. 19750. Closing Order
- Edison Electric Institute (EEI). Dec, 2018. Reaching Low-Income & Underserved Customers: Electric Company Initiatives. Presentation
- District of Columbia Public Service Commission (DCPSC). Jan, 2019. Formal Case No. 1149 Order No. 19741. Order
- Potomac Electric Power Company (Pepco). Jan, 2019. Senior Citizen and Disabled Resident Rate Credit Implementation Plan. Report
- Home Energy Analytics (HEA). Jan, 2019. What can we learn from AMI data? and How can we use it? Presentation
- Smart Electric Power Alliance (SEPA). Feb, 2019. District of Columbia Low-Income Programs Consolidated View. Presentation
- Smart Electric Power Alliance (SEPA). Feb, 2019. Data access & Protection – Impacts on Key Questions. Presentation
- D.C. Department of Energy and Environment (DOEE). Feb, 2019. Community Driven Planning: Lessons & Opportunities. Presentation
- D.C. Department of Energy and Environment (DOEE). Mar, 2019. DOEE Resilience Hub Recommendation Follow Up. Document

WG5: MICROGRIDS

- Smart Electric Power Alliance (SEPA). Aug, 2018. WG5: Microgrids August Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Sep, 2018. WG5: Microgrids September Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Oct, 2018. WG5: Microgrids October Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. WG5: Microgrids November Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Dec, 2018. WG5: Microgrids December Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. WG5: Microgrids January Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Feb, 2019. WG5: Microgrids February Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Mar, 2018. WG5: Microgrids March Meeting Presentation. Facilitator Presentation
- Electric Power Research Institute (EPRI). Sep, 2018. Challenges in Cost-Benefit Analysis for Microgrids. Presentation
- Shalom Flank. Oct, 2018. Attachment A – Microgrid Benefits by Category. Document
- Smart Electric Power Alliance (SEPA). Oct, 2018. WG5: Microgrids Working Group October Pre-Read Material. Presentation

- U.S. General Services Administration (GSA). Oct, 2018. MEDSIS Microgrid Working Group GSA Comments FC1130. Presentation
- D.C. DGS Sustainability & Energy. Oct, 2018. DC Public Service Commission MEDSIS Microgrid Working Group. Presentation
- District of Columbia Public Service Commission (DCPSC). Oct, 2018. PSC Staff Presentation on the State of Commission Microgrid Regulation in the District of Columbia. Presentation
- New Jersey Board of Public Utilities (NJBPU). Nov, 2018. Microgrid Report. Report
- Navigant. Nov, 2018. Community Microgrid Case Study and Analysis. Report
- Duane Morris. Nov, 2018. Who Should Pay for Utility-Scale Microgrids? Presentation
- George Washington University (GWU). Nov, 2018. Elements of Microgrid Regulation. Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. Version 1.0 WG5: Microgrid Assets. Document
- D.C. Homeland Security and Emergency Management Agency (DCHSEMA). Nov, 2018. District Preparedness System Doctrine. Web-page
- Smart Electric Power Alliance (SEPA). Dec, 2018. PC44 Regulatory and Commercial Models for Energy Storage. Document
- Navigant Research. Jan, 2019. Microgrid Business Model Regulation: Challenges and Opportunities. Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. Microgrid Business Model Pilot Homework. Stakeholder Activity
- Smart Electric Power Alliance (SEPA). Jan, 2019. Microgrid Business Model Review for February Meeting. Presentation
- Urban Ingenuity. Mar, 2019. A Microgrid for Gallaudet Financial and Other Benefits. Presentation

WG6: PILOT PROJECTS

- Smart Electric Power Alliance (SEPA). Oct, 2018. WG6: Pilot Projects October Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. WG6: Pilot Projects November Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Dec, 2018. WG6: Pilot Projects December Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. WG6: Pilot Projects January Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Feb, 2019. WG6: Pilot Projects February Meeting Presentation. Facilitator Presentation
- Smart Electric Power Alliance (SEPA). Mar, 2019. WG6: Pilot Projects March Meeting Presentation. Facilitator Presentation

- District of Columbia Public Service Commission (DCPSC). Oct, 2018. MEDSIS Staff Report: Section VII. Proposed MEDSIS Grant Funding Parameters & Proposed Demonstration Project. Report Section
- District of Columbia Public Service Commission (DCPSC). Nov, 2018. Proposed MEDSIS Gran Funding Parameters and Proposed Demonstration Projects. Presentation
- Smart Electric Power Alliance (SEPA). Nov, 2018. Pilot Evaluation Criteria Gap Assessment. Presentation
- Smart Electric Power Alliance (SEPA). Jan, 2019. Technology Readiness Level Model (Adapted from DOE). Overview Presentation
- U.S. Department of Energy. Jan, 2019. Technology Readiness Assessment Guide. Report
- Smart Electric Power Alliance (SEPA). Jan, 2019. V2.0: Pilot Evaluation Criteria Gap Assessment. Presentation
- Rural Energy for America Program (REAP). Jan, 2019. REAP Scoresheet RES EEI 2015. Example Score Sheet
- Data Center Energy Efficiency Grant Program (DCEEG). Jan, 2019. DCEEG Review Sheet. Example Score Sheet
- Electric Program Investment Charge (EPIC). Jan, 2019. EPIC Sample Evaluation Criteria. Example Evaluation Criteria
- Smart Electric Power Alliance (SEPA). Feb, 2019. MEDSIS Evaluation Criteria and Scoring Sheet. Strawman
- D.C. Department of Energy and Environment (DOEE). Mar, 2019. Locational Value of DER. Proposal
- D.C. Climate Action (DCCA). Mar, 2019. Commercial Class Rate Design to Incentivize Peak Load Shifting & Demand Reduction. Proposal
- Smart Electric Power Alliance (SEPA). Mar, 2019. Pilot Project Scoring Strawman. Comment Document
- Smart Electric Power Alliance (SEPA). Mar, 2019. Pilot Project Screening and Scoring Template Draft Revision 2. Strawman

A.8 Pilot Project Screening and Scoring Template

Level 1 Scoring Template

	Level 1 Pilot Project Screening		Applicant		REVIEWER NOTES
	PROJECT DATA				
	Applicant Name:		**Reviewer:**		
	Contact Name:		**Date of Review:**	2/13/2018	
	Applicant Phone:		**Contact Email:**		
	Project Description:				
	Estimated Total Project Cost:		[redacted]		

	Level 1 Screening	Guidance	Reviewer Notes
Yes	**Does applicant address all MEDSIS Principles?**	Was a response given to how the proposed project furthers each MEDSIS Principle specifically? If No, does not pass screening.	
Yes	**Are technologies proposed at TRL-7 or higher?**	Was adequate justification given for Reviewer to conclude all technologies required for the proposed project are at TRL Level 7 or higher? If No, does not pass screening.	
Yes	**Does project pass screening?**	STOP if "NO" answer provided to either of the above, project does not pass screening and is not scored.	

	Principle Scoring		
	Is the application consistent with MEDSIS Principles?	**How well does the proposed project, program, or iniative address each of the MEDSIS Principles?**	**Points Assigned (0 - 10 total)**
Yes	Does proposal contribute to the grid being well planned?	Supports Pepco's efforts to ensure the distribution planning process is open, transparent and stakeholder-informed. Encourages two-way data flow between third-parties and utilities for load forecasting, DER installation, and NWAs. Promotes the sharing of appropriate system-level data among stakeholders that promotes the District's DER goals while protecting customer privacy and system security. Contributes to infrastructure planning that is cost-effective; enables the optimal combination of distributed energy resources (DERs) with traditional capital investment by exploring non-wires alternatives; complies with legislatively mandated deployment of DER in the District; permits rational participation of consumers and distribution service providers; and plans for, tracks, and monitors DER penetration rates on the grid.	10
Yes	Does proposal ensure the grid remains Safe and Reliable?	Does not impair Pepco's ongoing investments and efforts of meeting and improving their safety and reliability performance as measured through their ongoing Merger commitments, DCPSC EQSS requirements, or other performance based metrics, if applicable. Facilitates the interconnection of DERs as well as all generation and storage options in a manner that does not compromise overall system safety and reliability Enhances data flow between stakeholders in a manner that promotes visibility of the grid, communications, and DER dispatchability in a manner that increases reliability, safety, and resiliency	10
Yes	Does proposal ensure the grid remains Secure?	Contributes to policies and practices to address cybersecurity threats around data access, data encryption, security audits, breach detection, threat & vulnerability assessments and standard responses, security awareness training Contributes to policies and practices to ensure the integrity and confidentiality of data and customer choice in sharing data and to ensure that the information security of all interfaces, devices and data operations involving customer data sharing includes sharing policies for aggregated data and personally identifiable information	10
Yes	Does the proposal offer a solution that is affordable for all District customers?	Eliminates or reduces risks from "stranded assets"? Contributes to NWA solutions that meet investment objectives at lowest overall lifecycle costs? Ensures distribution rates remain "just and reasonable"? Maximizes District's existing investment in AMI? Ensures fair interconnection and even deployment of DERs across all District communities?	10
Yes	Does the proposal contribute to the District's Sustainability Goals?	Aligns with the goals of the DC Clean Energy Omnibus Act of 2018? Promotes social equality? Leads to Increased amounts of non-carbon distributed generation and storage for excess of consumption across all customer classes? Increases the ratio of REC purchases within D.C. footprint as compared to outside the D.C. footprint?	10

Continued on next page

Level 1 Scoring Template - continued

Yes	Does the proposal ensure a grid that is Interactive?	Contributes to or does not hinder customers from accessing and sharing their data including the use of GreenButton Connect My Data functionality in the District Emphasizes the importance of improving and expanding consumer and stakeholder access to publicly available data related to distribution system constraints and technical capacity Encourages two-way data flow between third-parties and utilities for load forecasting, DER installation and NWAs. Encourages the interaction and communication between DERs, the distribution system, and the macro grid and use of those technologies that provide value to the entire distribution system, such as smart inverters, over individual customers Contributes to stakeholder engagement during Pepco's RFI and RFPs executed as part of the NWA planning process	**10**
Yes	Does the proposal ensure that the District's modern energy system is non-discriminatory, open to competition, and provides for customer choice in accordance with District law?	Affords DER providers with a low-cost and streamlined interconnection process that allows DERs to compete on a level playing field with wholesale energy Unlocks customer and system data to meet system needs and better serve customers Contributes to rates that are "fair and reasonable" Encourages the competitive provision of services now included in the regulated monopoly distribution services Prevents cost shift among or within customer classes	**10**
	Principles Score	**A total of 70 points is possible (10 points per Principle)**	**70**
	Other Factors Scoring		
	Does the application satisfy these other criteria?	**How does the proposal adequately address each of the below?**	**Points Assigned (0 - 10 total)**
Yes	**Is project budget and financing reasonable?**		**10**
Yes	**Is implementation timeline reasonable?**		**10**
Yes	**Does the project/ proposal include any specified**	For now the only exclusion is the project can not be led by unregulated subsidiaries and affiliates of regulated utilities. These entities can be part of the overall project team	**10**
	Other Factors Score	**A total of 30 points is possible (10 points per question)**	**30**
	Total Score	A total of 100 points is possible	**100**
	Screening Results		
Yes	**Does proposal qualify for RFP?**	Proposals which pass Level 1 screening and are scored at 80 points or higher move on to RFP stage.	

Level 2 Administrative Scoring Template

	Level 2 Pilot Project Screening Screening	Applicant		REVIEWER NOTES

PROJECT DATA			
Applicant Name:		**Reviewer:**	
Contact Name:		**Date of Review:**	**2/13/2018**
Applicant Phone:		**Contact Email:**	
Project Description:			
Estimated Total Project Cost:		[redacted]	

Administrative Parameters			
	Administrative Requirements	**Does the proposal adequately address each requirement?**	**REVIEWER NOTES**
Yes	Was the proposal submitted on time and in the format requested in the RFP	Hard copies received by due date Electronic files submitted in correct format	
Yes	Is the type and purpose of the Project clearly identified in the proposal	Description of the project Ownership and management structure of the project Will the project provide service to the general public or a more limited number of customers	
Yes	Does the proposal include all required technical sections?	Technical Merit and Need Technical Approach Environmental Benefits	
Yes	Does the proposal include information on the respondent's track record, team and qualifications?	Experience providing similar projects X references as requested in the RFP are provided Project team with roles & responsibilities	
Yes	Does the proposal include a project funding plan/ budget in format requested?	Private financing MEDSIS funding request Cost benefit analysis Economic and fiscal impacts	
Yes	Does the applicant provide a public interest determination in the format requested in the RFP?	All factors specified in the RFP are addressed and the public interest is advanced. Note: This may be a separate scoring addressing the factors specified by the Staff in the MEDSIS Staff Report.	
Yes	Does the proposal include a risk management plan?	Types of risk to be managed Property and liability insurance provisions Regulatory waivers and exemptions TRL 7 - 8 risk mitigation provisions (if applicable)	
Yes	Does the proposal address impacts on obligation to serve and public safety	Provision of reliable electric service including if the pilot does not operate Provisions to address public safety	
Yes	Does the proposal address the need for any enabling contracts (if applicable)	Status and description of any contracts needed to support the pilot	
	Can proposal be scored?	**Determine proposal eligibility to be scored**	**REVIEWER NOTES**
Yes		Three or more "No" = Disqualified, 2 "No" answers = Advisory Board input, 0 or 1 "No" answers = Can b	

Level 2 RFP Scoring Template

	RFP SCORING SHEET MEDSIS Pilot Project	Applicant		REVIEWER NOTES

PROJECT DATA				
Applicant Name:		Reviewer:		
Contact Name:		Date of Review:	2/13/2018	
Applicant Phone:		Contact Email:		
Project Description:				
Anticipated Total Project Cost:				
Co-Funding:		Passed Level 1 Screen?	Yes	
Requested MEDSIS Funding		Passed Level 2 Screen?	Yes	

No	TECHNICAL MERIT AND NEED (20 Points)	SCORE (1 - 5)	GUIDANCE	ADDITIONAL NOTES AND COMMENTS	SCORE %
1	The proposed Pilot Project is technically feasible, achievable, and can be completed within an appropriate timeline	5			100%
2	The proposed project lays the groundwork for technological advancement and breakthroughs that will overcome barriers to achieving DC's Clean Energy goals	5			100%
3	The proposal contains a comprehensive and strategic approach to promote or maximize a cross section of DER penetration in the district	5			100%
4	The Pilot Project approach is scalable and replicable in the District and includes an effective and viable strategy to capture lessons learned and best practices to guide future projects	5	A description is provided defining how the Pilot project can be scaled up over time if found to be beneficial and cost effective.		100%
5	Commission Oversight issues are addressed in the proposal	5	How will commission oversight of the pilot be ensured? What waivers from Commission rules are required? How does the applicant propose to handle disputes? Reporting and evaluation strategy for evaluating pilot outcomes.		100%
	Sub-Total	25	Scored Points	20	100%

No	TECHNICAL APPROACH (30 Points)	SCORE (1 - 5)	GUIDANCE	ADDITIONAL NOTES AND COMMENTS	SCORE %
1	The proposed Pilot Project meets the technical requirements identified in the RFP	5	A separate scoring sheet may be used to address these specific requirements		100%
2	The implementation plan is well developed with achievable project milestones	5	Proposed timelines for the project and all reports and evaluations is provided		100%
3	Adequate project support is provided including technical support related to any deployed technologies	5			100%
4	Details are provided on the interconnection requirements of the project with the existing electrical grid and PJM Interconnection requirements are appropriately addressed (if applicable)	5	Section Section V. Interconnection Considerations from PSC presentation for guidance. Will PJM have operational visibility of the Pilot Project during operation? Will the Pilot Project participate in PJM's organized markets? Any known FERC regulatory requirements are met.		100%
5	Proposal includes a community engagement plan, as applicable for the project being proposed	5	Consider applicability of DOEE's Equity Advisory Group recommendations for community engagement		100%
6	The proposal describes how the Pilot Project will contribute to reliability and resiliency to District customers	5	Required as part of a Public Interest Determination		100%
7	The project will lower electric or gas bills for some or all ratepayers	5	Required as part of a Public Interest Determination		100%
8	The proposal explains how the solution will provide useful information that will further the energy system modernization goals.	5	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		100%
9	A description of impacts on obligation to serve is provided in the proposal	5	Will the pilot project share the obligation to serve with another entity? How will customers receive electricity if the pilot project does not operate?		100%
10	A description of safety requirements, compliance measures, and consumer protections is provided	5	Detail safety and maintenance measures. Consumer protection and retail choice requirements, if applicable. Community and industry educational development and planned outreach.		100%
	Sub-Total	50	Scored Points	30	100%

Continued on next page

Level 2 RFP Scoring Template - continued

No	ENVIRONMENTAL Impacts (20 Points)	SCORE (1 - 5)	GUIDANCE	ADDITIONAL NOTES AND COMMENTS
1	The pilot project includes a clean or renewable energy source or other DER that promotes sustainability	5		
2	The short-term and long-term environmental impacts (costs and benefits) of the Pilot Project on key factors in the District is positive	5		
3	The Pilot Project advance the District's Energy and Sustainability Goals	5		
4	All site selection considerations have been addressed	5		
	Sub-Total	**20**	**Scored Points**	**20**

No	QUALIFICATIONS AND EXPERIENCE (20 Points)	SCORE (1 - 5)	GUIDANCE	ADDITIONAL NOTES AND COMMENTS
1	The project team features participation from a variety of local stakeholders including District government agencies, or organizations connected to the District governments, or CBR enterprises	5		
2	The team is well-rounded and qualified to develop, support, implement, and maintain the Pilot Project throughout its duration	5		
3	The roles and responsibilities of the team are clearly defined and team members have the experience, expertise, and ability to effectively complete their defined responsibilities	5		
4	The team demonstrates ability to meet deadlines and complete milestones for large complex projects and references are provided for both the applicant and the team member assigned in key positions on the project	5		
5	The Applicant provides details of their experience relevant to the proposed project, including but not limited to, implementing DER facilities on a similar scale	5		
	Sub-Total	**25**	**Scored Points**	**20**

No	BUDGET and RISK MANAGEMENT (10 Points)	SCORE (1 - 5)	GUIDANCE	ADDITIONAL NOTES AND COMMENTS
1	The factors critical for the Pilot Project's success (including risks, barriers, limitations, and viable solutions) are adequately addressed.	5	Risk mitigation approach required for solutions scored at TRL level 7 or 8	
2	Property and liability insurance coverage is in place for the Pilot Project and all regulatory waivers or exemptions needed to complete the Pilot Project are properly addressed.	5		
3	The proposed budget to develop the Pilot Project is comprehensive, appropriate, and reasonable. Funding Plan does not have to be cost effective for pilot but should list benefits expected during the pilot and indicate if project will be cost effective over its expected life.	5	Provide estimates of the property, sales, and other District tax revenue the project will generate during construction and operation for the first three years. Describes the employment and business opportunities the project will create in the District. Identifes which District Wards and neighborhoods will benefit and how. The proposed budget minimizes administrative and overhead costs	
4	The project funding plan indicates all cost sharing or outside funding sources. MEDSIS funding request is appropriate portion of funding plan	5	The Applicant justifies the need for MEDSIS funding support by demonstrating why the proposed work is not adequately supported by competitive or regulated markets and/or how the project will not be able to move forward without funding from MEDSIS. Minimum match share requirements are exceeded. Match share costs are contributed by a variety of project partners and interested stakeholders	
5	All enabling contracts are specified or a plan in place for securing the contracts	5		
	Sub-Total	**25**	**Scored Points**	**10**

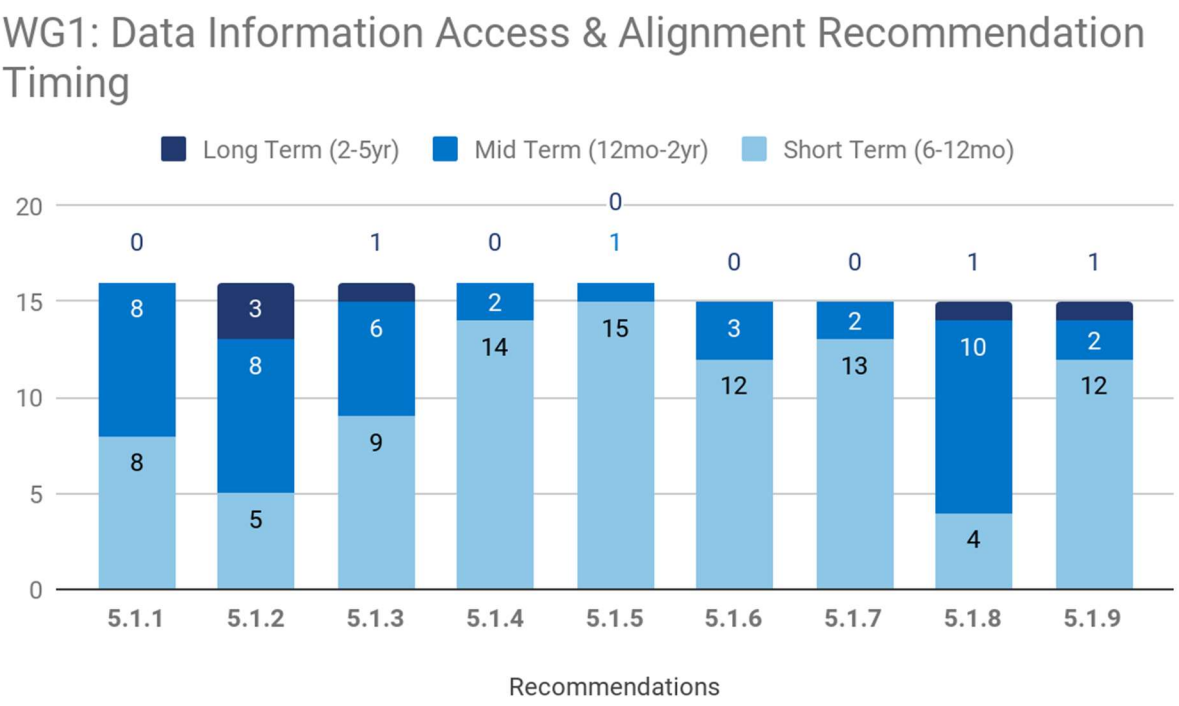
	Total Score	A total of 100 points is possible	**100**

A.9 Pilot Projects "Gap" Assessment

Pilot Project Topic	Gap/ Recommendation
1. Pilots & Demonstrations	1. Consensus – no need to distinguish between pilots and demonstrations in applications 2. Consensus – applicants should indicate if a regulatory waiver is required for their project in their application 3. Consensus - "scalability and replicability" of the project should be addressed by applicant in their application
2. Exclusions	1. Consensus – EE projects should not be excluded now that FC1148 case is closed. EE components of pilot projects should be closely coordinated with DC SEU programs 2. Consensus – MEDSIS funds should be used for technology advancement and not R&D, funding startups, or commercialization of technologies **3. Gap** – Group should provide more detail/ definition around "unproven technologies" by developing a technology readiness metric 4. Consensus – Unaffiliated subsidiaries of PEPCO and WGL should not lead projects but not be prevented from participating in projects
3. Key Considerations	1. Consensus – existing projects should be eligible but not get slowed down by participating as a Pilot project 2. Consensus – size/ financial wherewithal of applicant should be a factor but only to the extent it validates applicant's ability to execute the Pilot fully
4. Grant Funding Qualification Parameters	1. Consensus – Environmental "impacts" should be address by applicant – costs and benefits 2. Consensus – a ceiling should be established for the funding available to projects **3. Gap** – Public Interest Determination should incorporate the MEDSIS vision. Need to map MEDSIS principles to these funding parameters to ensure alignment 4. Consensus - Scalability and replicability requirement should be captured within this parameters

Pilot Project Topic	Gap/ Recommendation
5. Process & Timeline	1. Consensus – process should include an initial funding stage where applicants apply and then are filtered out **2. Gap** – timing guidance should be provided for evaluation of the proposals **3. Gap** - phases should be given time ranges and criteria developed for moving between phases 4. Consensus – there should be one RFQ process that exhausts all the funding rather than a multi-RFQ process as 5. Consensus – not all projects have to go through all timing phases, depending on the project 6. Consensus – Phase 5 should be renamed as "Implementation" to avoid confusion that all projects are major construction projects
6. Pilots Project Selection	1. Consensus – Independent board leveraging industry stakeholders is desired for pilot selection process. Group would be referred to as third-party advisor 2. Consensus – Board would advise DC PSC NOT decide on actual pilots 3. Consensus – DC PSC had final approval authority on pilot's selected **4. Gap** – Makeup of the board (NYSERDA, CEC, DOEE, OPC, Non-profits, IREC, RAP, etc.?) and actual governance structure
7. Monitoring, Reporting & Evaluation	1. Consensus – pilot projects will all require 3 quarterly reports and one final yearly report with option for more regular reporting defined project by project **2. Gap** – need to define final project evaluation process

A.10 Recommendation Timing



5.1.1 DCPSC to Explore Metric for Evaluating Carbon Footprint Impact of DER Projects

- How long will it take for a carbon footprint impact metric to be implemented by the DCPSC in the District?

5.1.2 DCPSC to Develop Benefit Cost Analysis (BCA) Methodology

- How long will it take for a benefit cost analysis (BCA) methodology to be implemented by DCPSC in the District?

5.1.3 DCPSC to Align MEDSIS with Clean Energy DC Act

- Continuous effort, N/A for timing

5.1.4 DCPSC to Continue to Improve Small Generator Interconnection Process

- Continuous effort, N/A for timing

5.1.5 DCPSC to Revise Language in MEDSIS Vision Statement

- How long will it take for the DCPSC to revise the language in the MEDSIS Vision Statement?

5.1.6 DCPSC to Develop Publicly Available System-Level Data Web-page

- How long will it take for the DCPSC to develop a publicly available system-level data web-page?

5.1.7 DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis

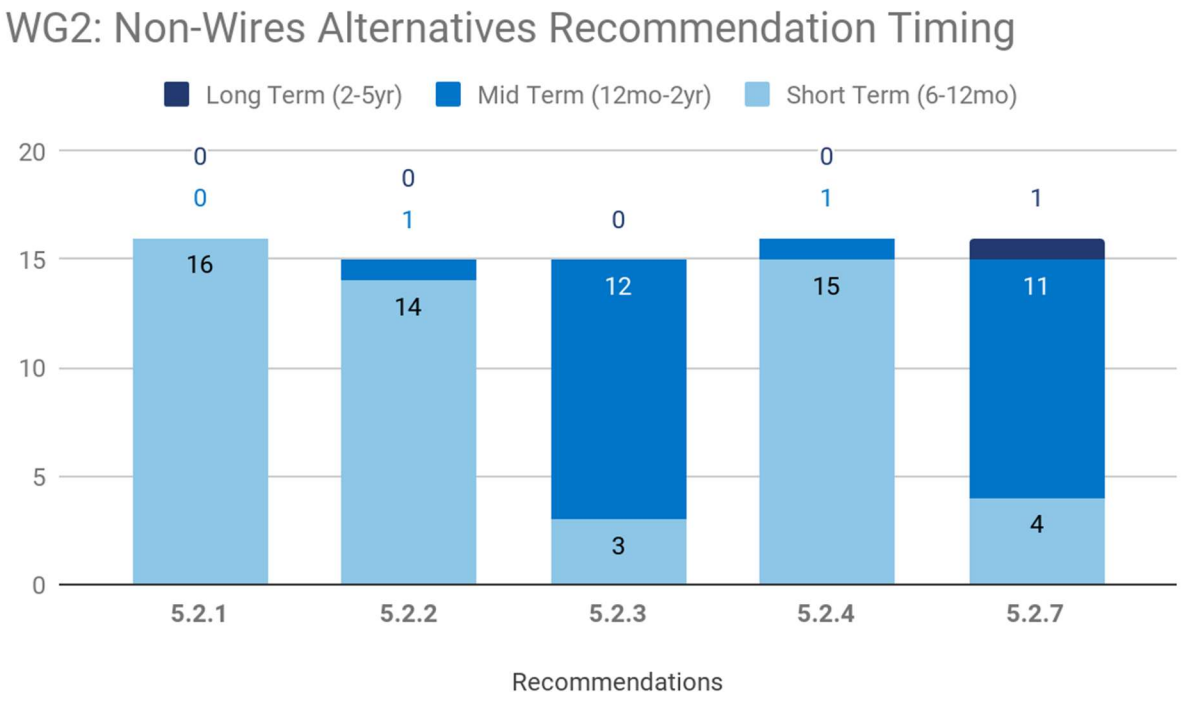
- How long will it take for Pepco to implement the directive to update its hosting capacity maps on a monthly basis?

5.1.8 DCPSC to Direct Pepco to create a secure web portal for RFP Responses and Programmatic Data Requests

- How long will it take for Pepco to create a secure web portal for RFP responses and programmatic data requests?

5.1.9 Apply MEDSIS Guiding Principle Metrics for General DCPSC Decision Making

- How long will it take the DCPSC to apply MEDSIS Guiding Principle Metrics for its general decision making?



5.2.1 DCPSC to Establish a NWA Definition

- How long will it take for the DCPSC to establish a NWA definition?

5.2.2 DCPSC to Establish NWA Classifications

- How long will it take for the DCPSC to establish NWA classifications?

5.2.3 DCPSC Should Order a Stakeholder-Informed DSP and NWA Consideration Process

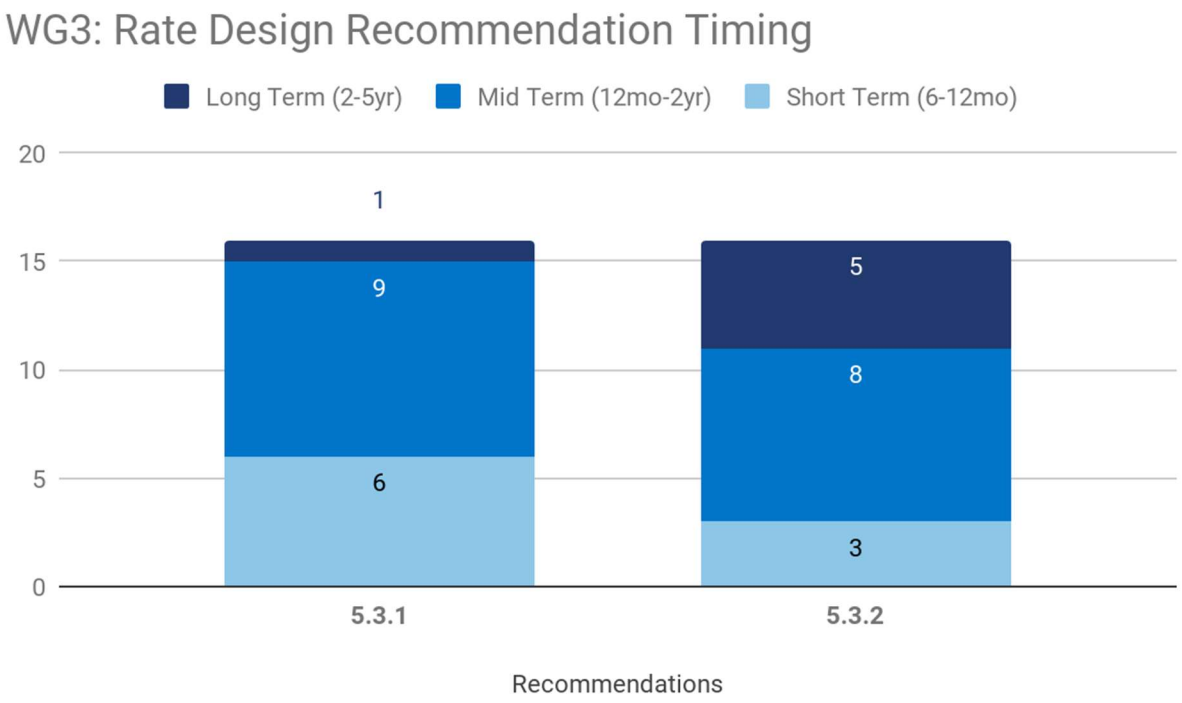
- How long will it take Pepco to implement the stakeholder-informed DSP and NWA consideration process and get live?

5.2.4 DCPSC to Establish an Advanced Inverter Definition

- How long will it take for the DCPSC to establish an advanced inverter definition?

5.2.7 DCPSC to Establish Stakeholder Working Group around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders

- How long will it take for the working group to develop standards and a plan for deployment?

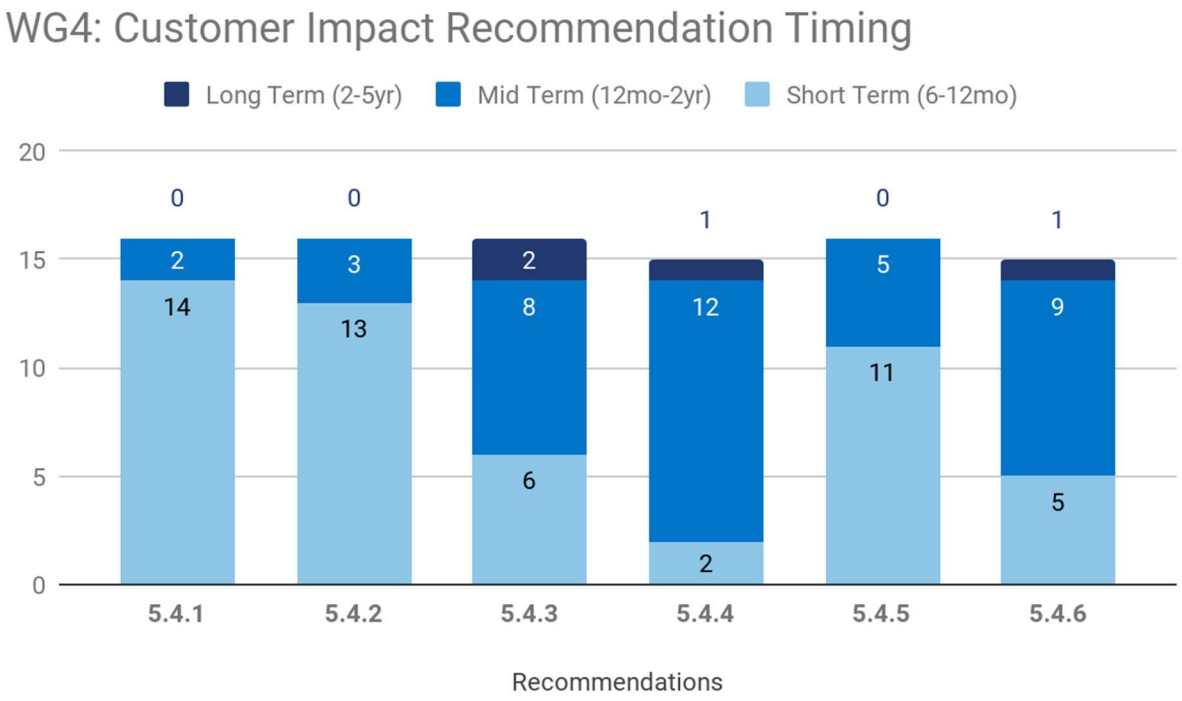


5.3.1 DCPSC to Reconvene Dynamic Pricing Working Group

- How long will it take for the working group to develop and propose a program to the DCPSC for approval?

5.3.2 DCPSC to Initiate a Value of DER and Value of Grid Study

- How long will it take for the Value of DER and Value of Grid Study to be completed?



5.4.1 DCPSC to Enhance and Consolidate Customer Education Materials

- How long will it take for the DCPSC to develop and host a site that provides customer education materials for District customers?

5.4.2 DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers

- How long will it take for the DCPSC to develop and host a site that provides competitive energy supplier offers and tools for evaluation for District customers?

5.4.3 DCPSC to Work with Pepco to Enhance Customer Data Access and Protection

- How long will it take the first pass of implementation of Green Button as an iterative process?

5.4.4 DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments

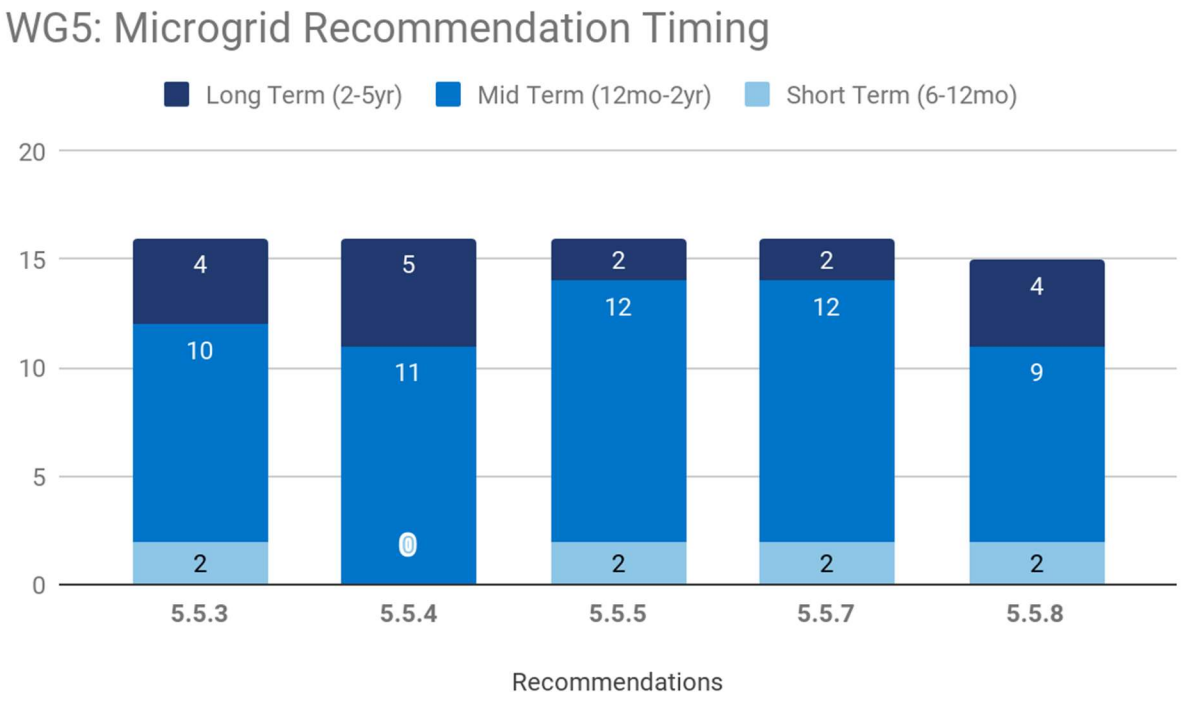
- How long will it take Pepco to launch this program?

5.4.5 DCPSC to Support Customer Participation in Low-Income Programs

- How long will it take for the DCPSC to have low-income information available on their website and application data shared across programs?

5.4.6 DCPSC to Revise CBOR Support the MEDSIS Pilots Projects Phase

- How long will the rulemaking take?



5.5.3 DCPSC to Establish New Regulated Entity of "Microgrid Operator"

- How long will it take the DCPSC to establish the microgrid operator and determine the appropriate set of regulations?

5.5.4 DCPSC to Direct the Utility to Establish a Customer Microgrid Schedule

- How long will it take for the utility to establish a customer microgrid schedule?

5.5.5 DCPSC to Determine How Utilities Recover Costs of Microgrid Assets

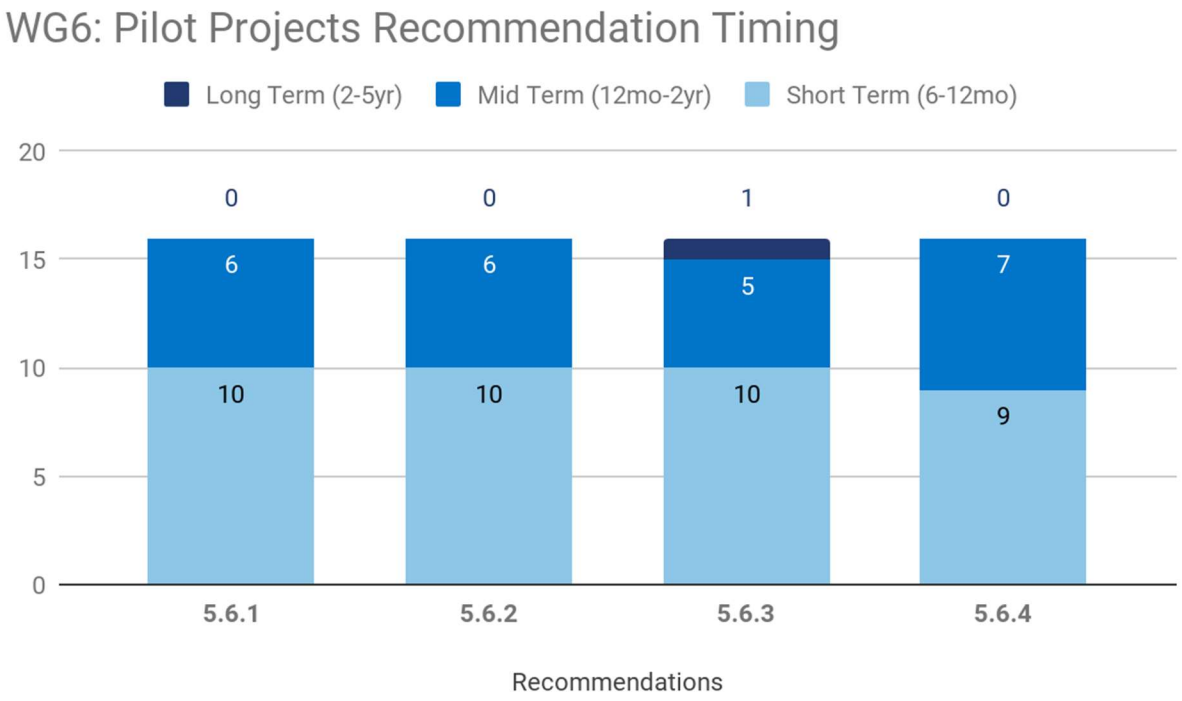
- How long will it take for the DCPSC to implement this recommendation?

5.5.7 DCPSC to Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids and Storage

- How long will it take for the DCPSC amend current interconnection rules to address interconnection and islanding rules for microgrids and storage?

5.5.8 DCPSC/DC Council to Modify Methodology for Calculating DCPSC and DC Law Surcharges of District Customers' Bills

- How long will it take for the DCPSC/DC Council to modify the methodology for calculating the system benefit charges?



Pilot Projects - Used a blanket question for all four pilot project recommendations: How long will it take to implement the components of each recommendation into the MEDSIS Pilot Project process?

5.6.1 DCPSC to Adopt Pilot Exclusions

5.6.2 DCPSC to Adopt Pilot Project Selection Process with Two Step Screening

5.6.3 DCPSC to Adopt Grant Funding Qualification Parameters

5.6.4 DCPSC to Adopt the Pilot Projects Governance Model

A.11 Recommendation Alignment with the MEDSIS Guiding Principles

During the April 26th meeting, SEPA conducted an exercise to get a general sense from the 18 organizations that participated as to how recommendations aligned to the MEDSIS Guiding Principles. Participants gave recommendations a score between 0 and 3 on how well they aligned with the seven MEDSIS Guiding Principles listed below. A score of 0 was given to a recommendation if it negatively impacted the principle, 1 if it had no impact, 2 for a weak positive impact, and 3 for a strong positive impact.

MEDSIS Guiding Principles

Sustainable: A sustainable energy delivery system will meet the energy needs of the present without compromising the ability of future generations to meet their own energy needs by focusing on the triple bottom line: environmental protection, economic growth, and social equality.

Well-Planned: With no large-scale generation in the District, the Commission must ensure that the distribution and transmission systems are strong and robust enough to withstand low probability, high impact events like storms, floods, and physical and cyber threats. To meet these needs, the District's modem energy delivery system must be developed in a strategic manner that is data-driven, incorporates advanced technologies, and is collaborative and open - allowing for consumer and stakeholder input.

Safe & Reliable: The Commission will ensure that utilities meet and improve safety and reliability performance and that the increasing volume of DERs interconnecting to the District's grid does not negatively impact the safety or reliability of the energy delivery system.

Secure: The modern energy delivery system must be secure from both physical attacks to critical infrastructure components as well as from cybersecurity attacks that target energy information systems and private consumer information.

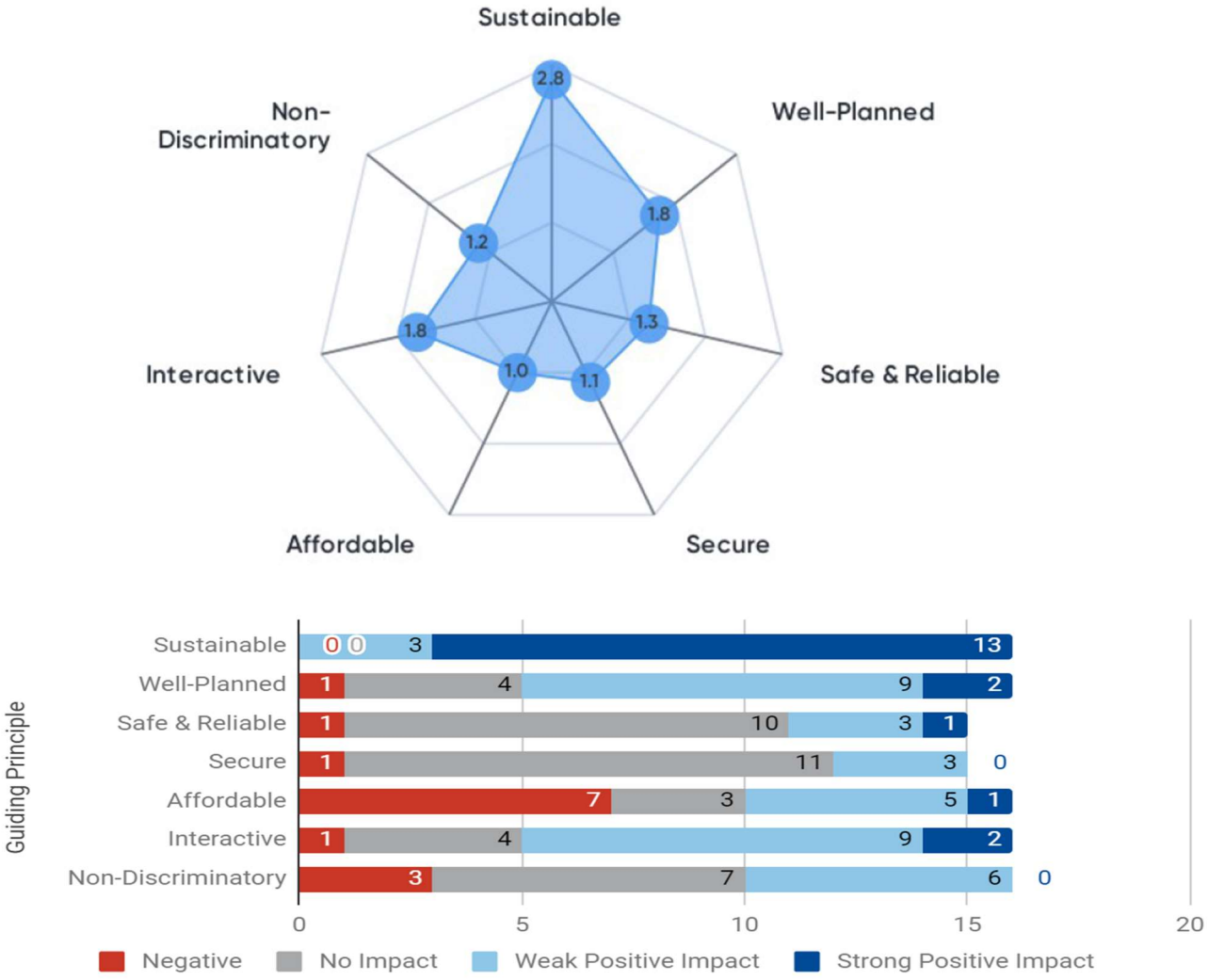
Affordable: The Commission has a duty to ensure that rates for distribution service are just and reasonable. The Commission balances the desire of customers to keep rates down with the need to ensure that utilities remain financially healthy, able to attract investors, and pay for needed infrastructure maintenance and development. Balancing these interests, in the context of system modernization, becomes especially challenging when considering costly upgrades to the distribution system as well as potential ratepayer subsidization of costly renewable and DER technologies.

Interactive: As an increasing number of smaller scale and more localized resources come online the relationship between the energy distribution company, the consumer, and service providers will become increasingly complex and dynamic. New services will become available, energy and data will increasingly flow in multiple directions, and different types and scales of resources will enter the distribution system. A modern energy delivery system must become more interactive and flexible to accommodate these types of resources while maintaining system reliability and security. This interactivity is critical both in terms of managing the distribution system and in providing locational transparency and technical feasibility which will allow ratepayers, customer-generators, and DER providers to make informed energy choices.

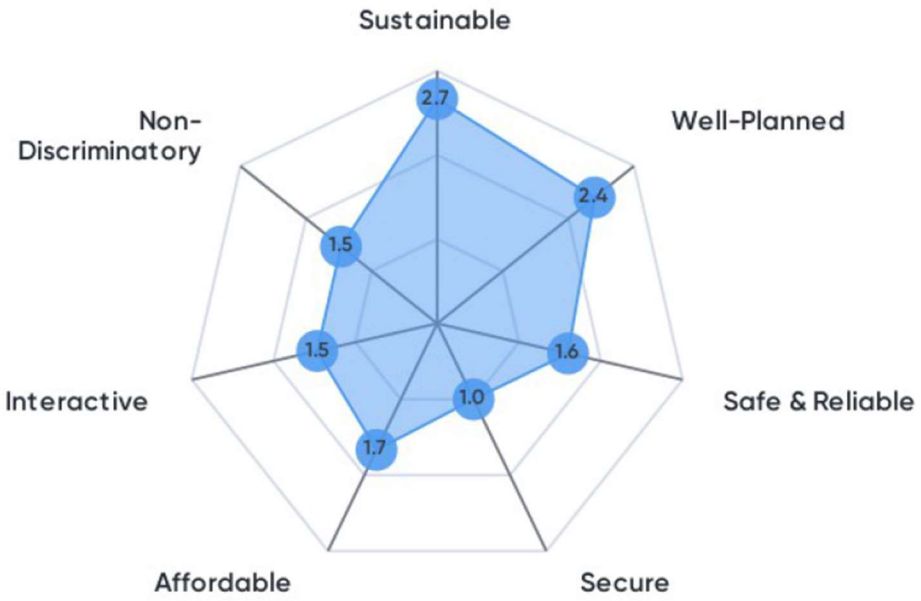
Non-Discriminatory: Nondiscrimination in the operation of the District's energy infrastructure is integral to the Commission's mandate to supervise energy utilities in the District of Columbia. Furthermore, since the restructuring of the energy markets, the need for the Commission to ensure that energy utilities operate in a nondiscriminatory manner has proliferated. Nondiscrimination covers both the technical operation of and the rates and fees charged for utilizing and accessing the energy utility infrastructure.

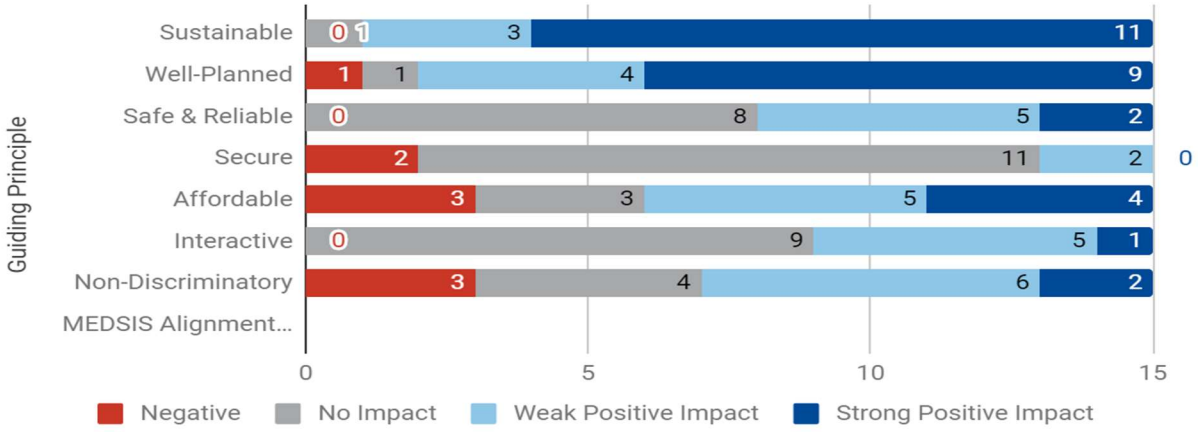
Activity Results:

5.1.1 DCPSC to Explore Metric for Evaluating Carbon Footprint of DER Projects

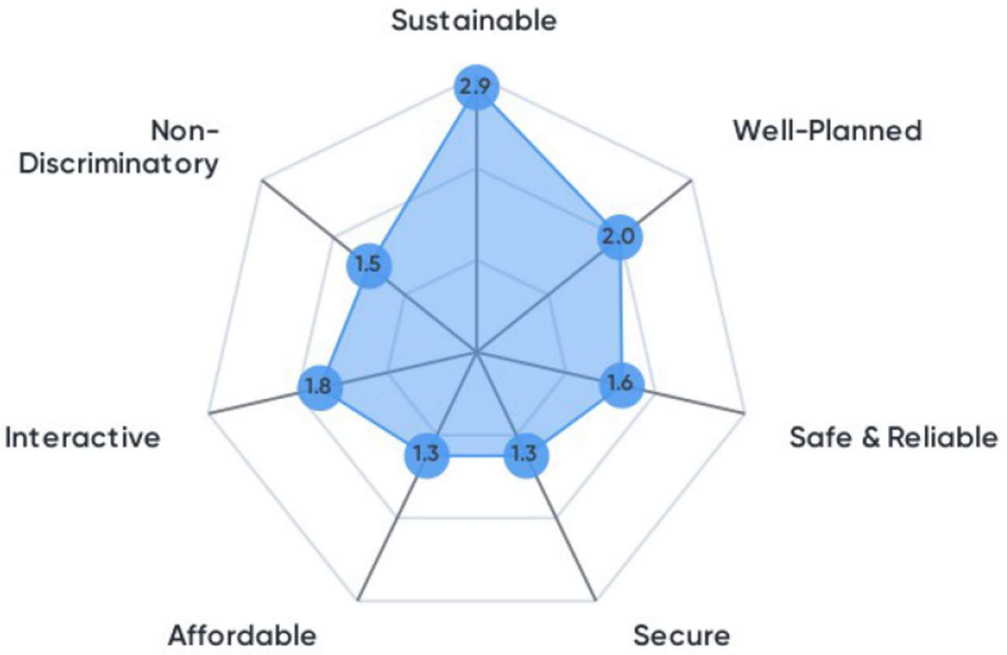


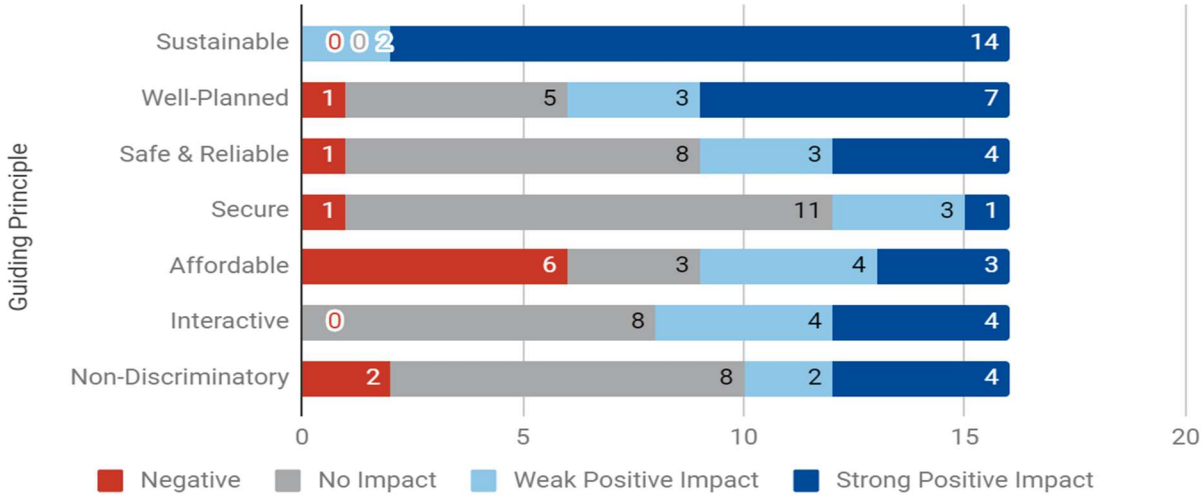
5.1.2 DCPSC to Develop Benefit Cost Analysis (BCA) Methodology



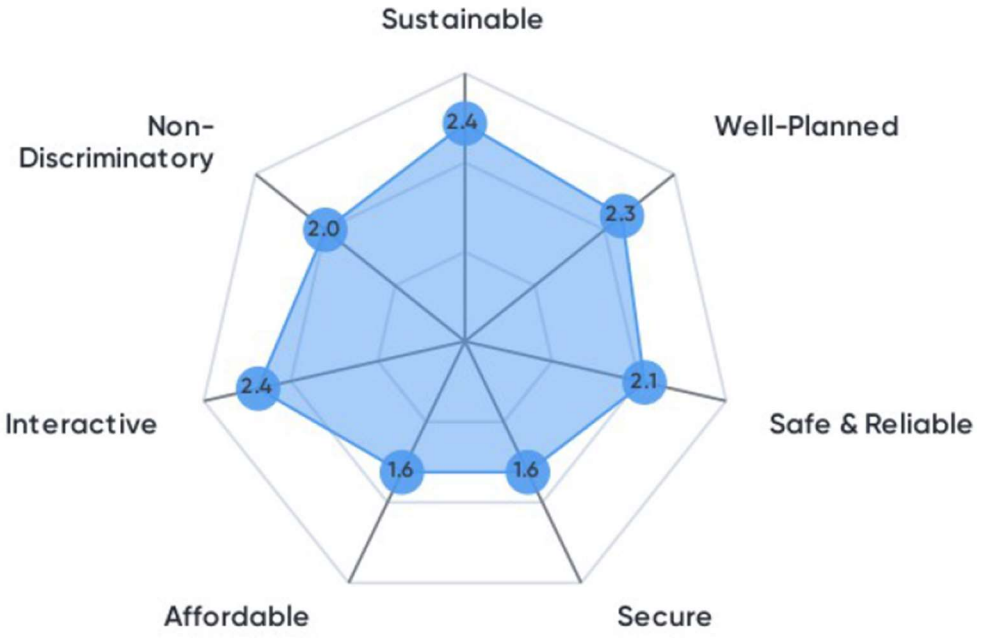


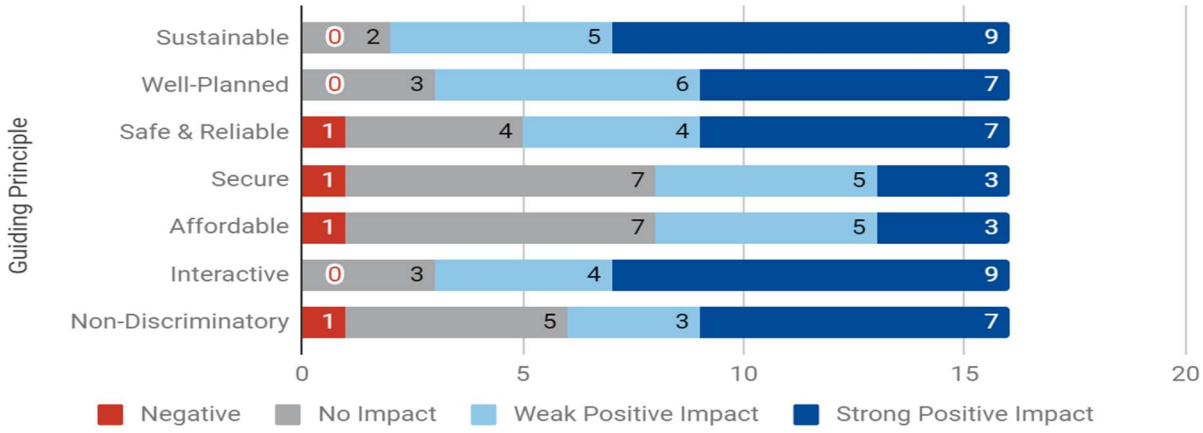
5.1.3 DCPSC to Align MEDSIS with Clean Energy DC Act



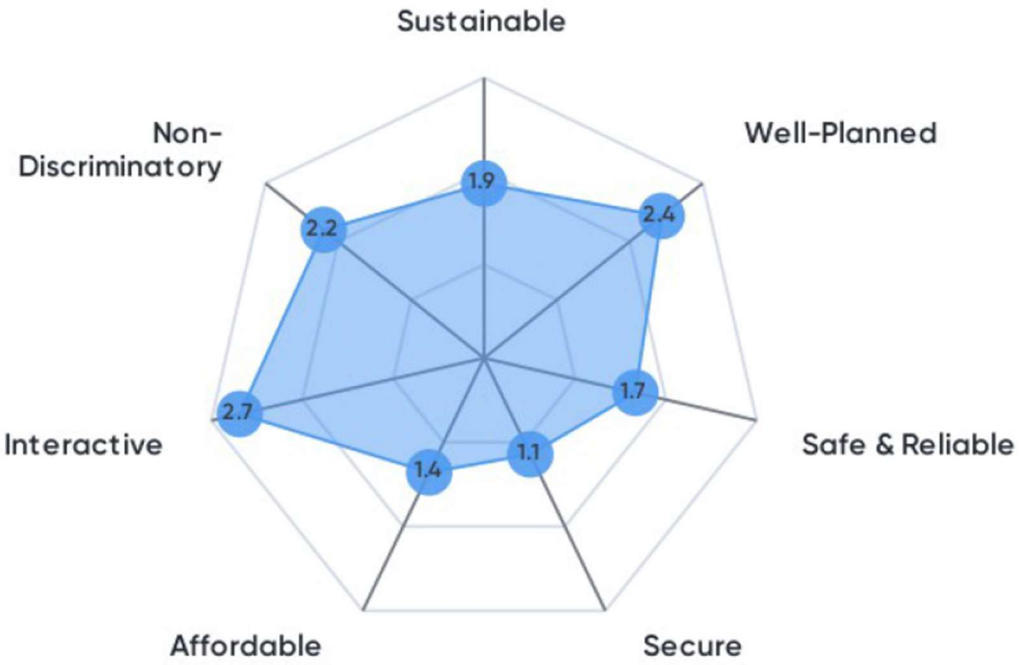


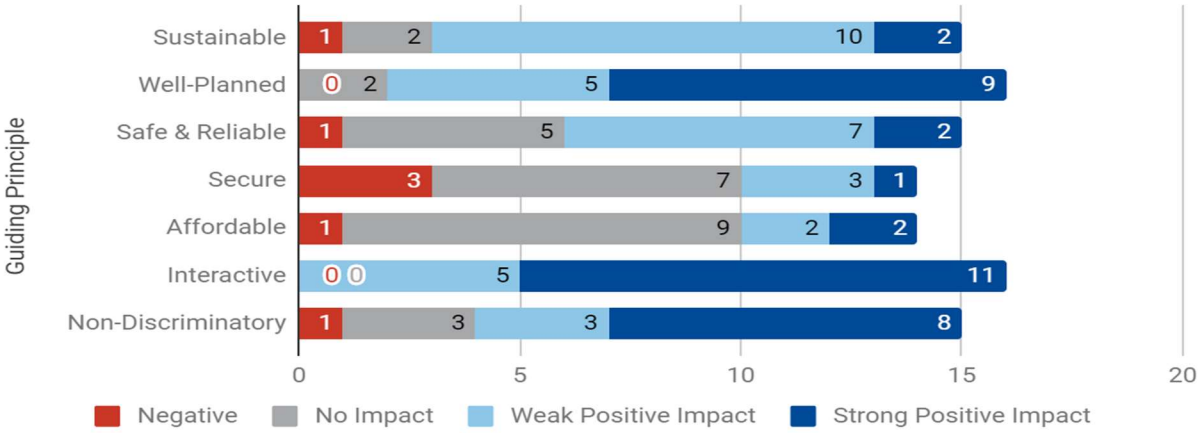
5.1.4 DCPSC to Continue to Improve Small Generator Interconnection Process



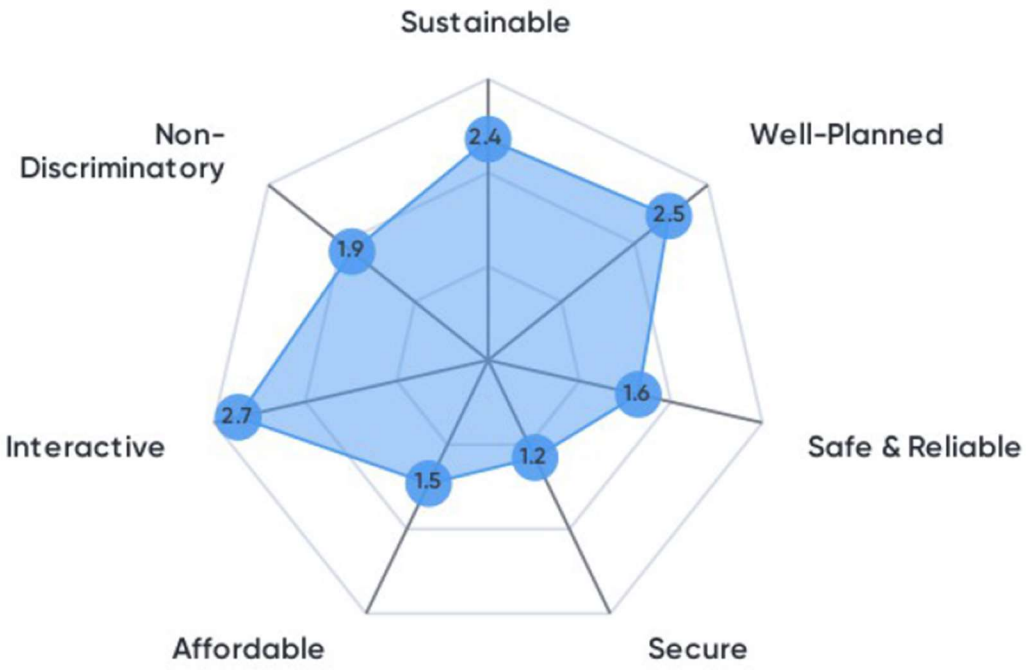


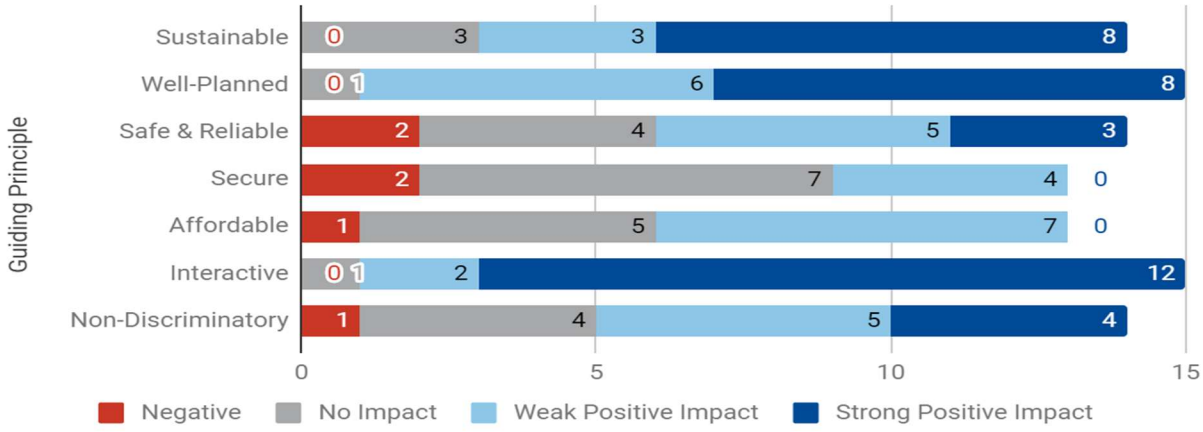
5.1.6 DCPSC to Develop Publicly Available System-Level Data Webpage



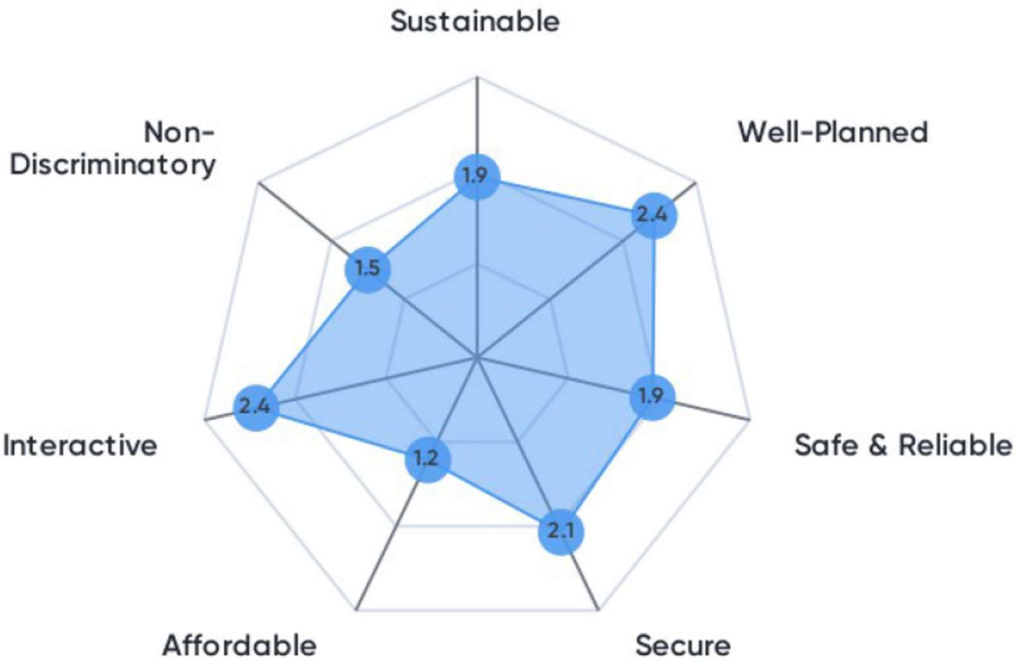


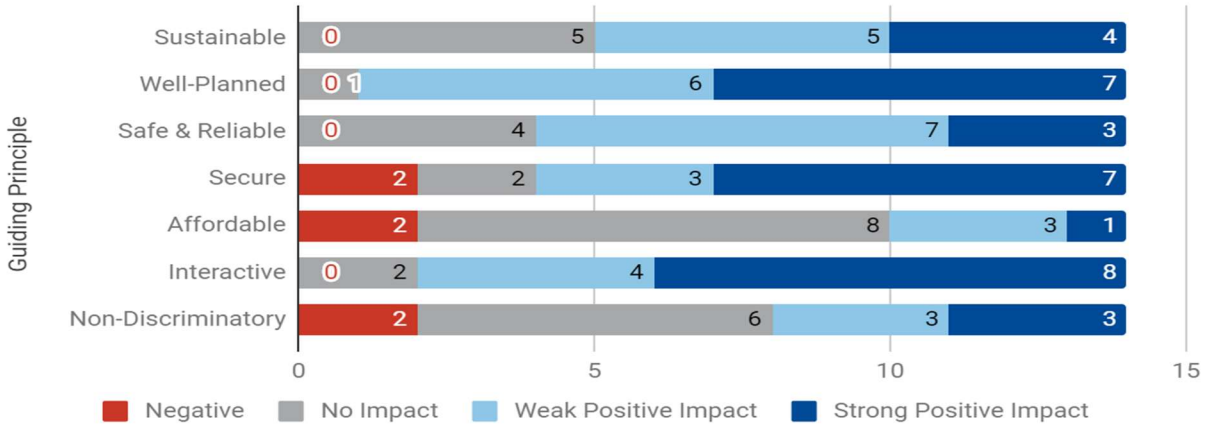
5.1.7 DCPSC to Direct Pepco to Update Hosting Capacity Maps on a Monthly Basis



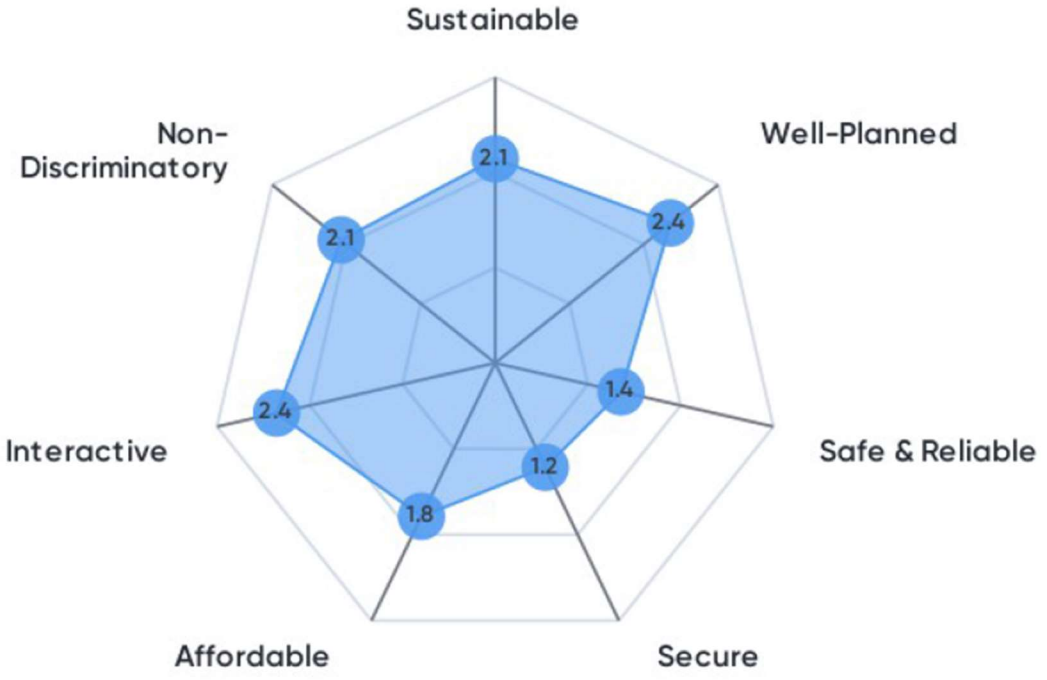


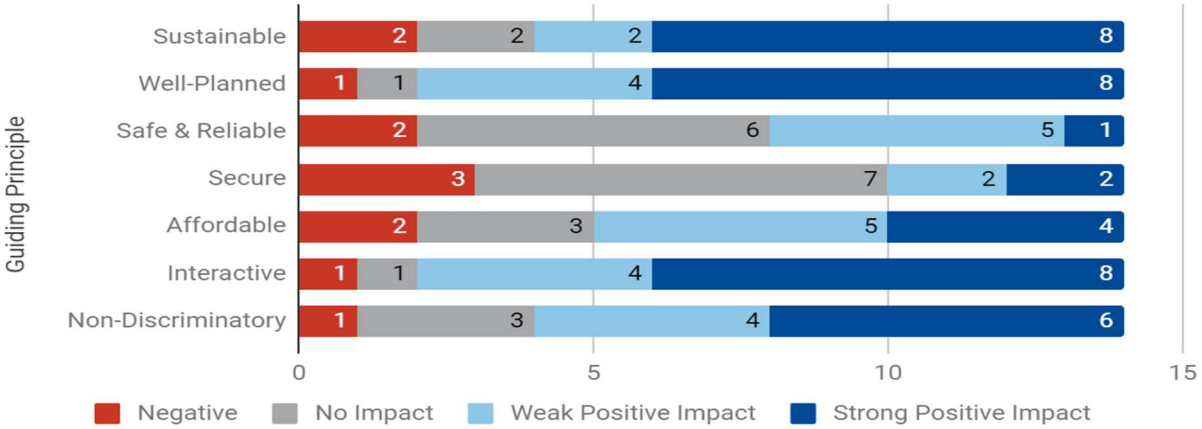
5.1.8 DCPSC to Direct Pepco to create a secure web portal for RFP Responses and Programmatic Data Requests



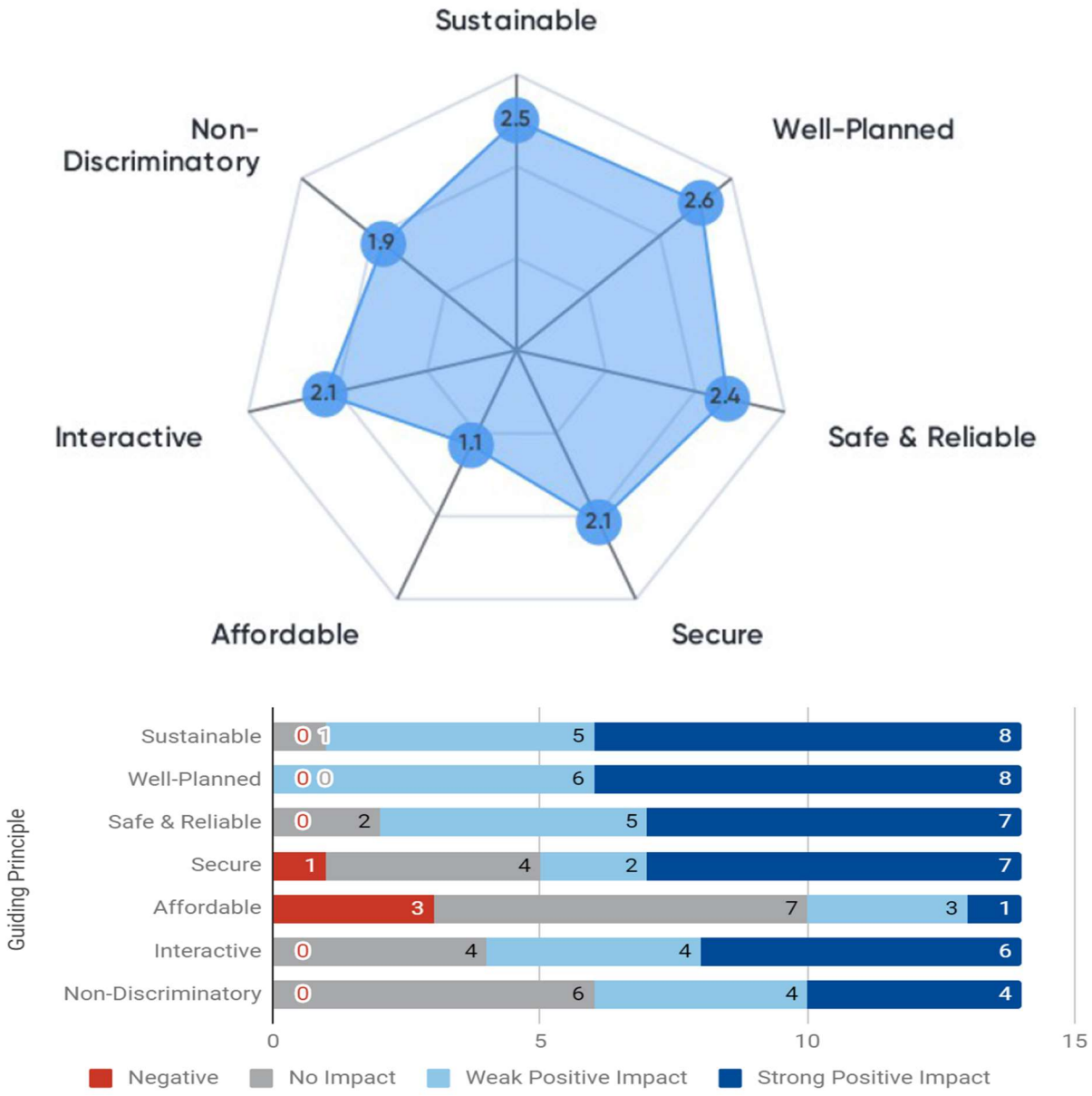


5.2.3 DCPSC Should Order a Stakeholder-Informed DSP and NWA Consideration Process

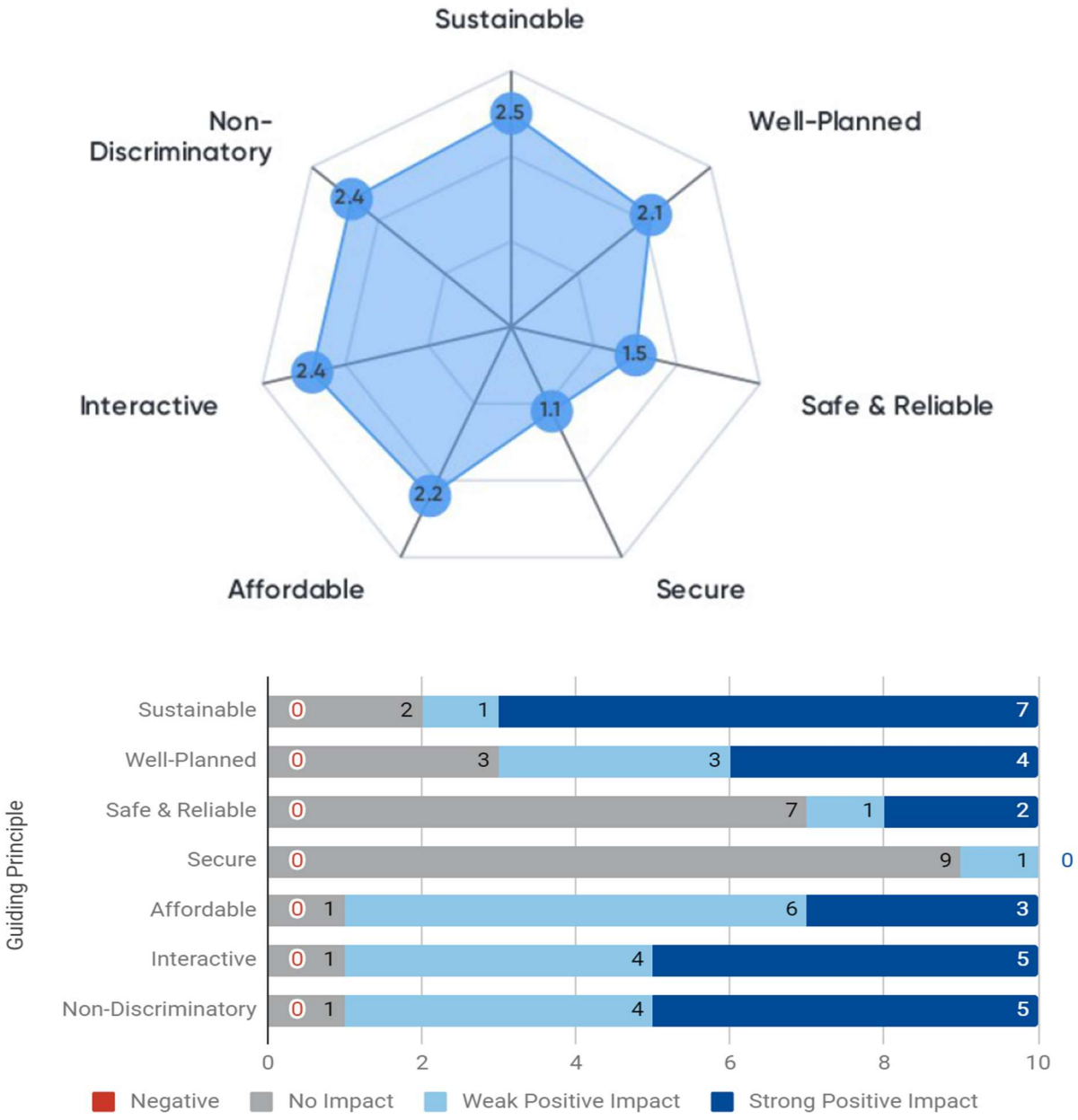




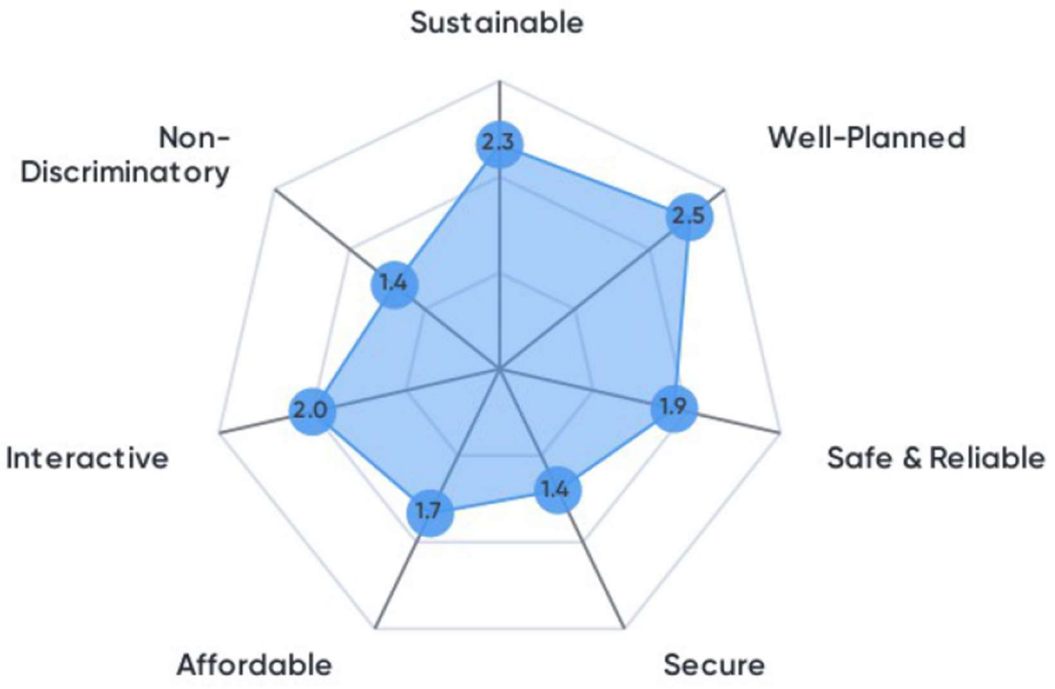
5.2.7 DCPSC to Establish Stakeholder Working Group around IEEE 1547-2018 Standards and Advanced Inverter Deployment for District Stakeholders

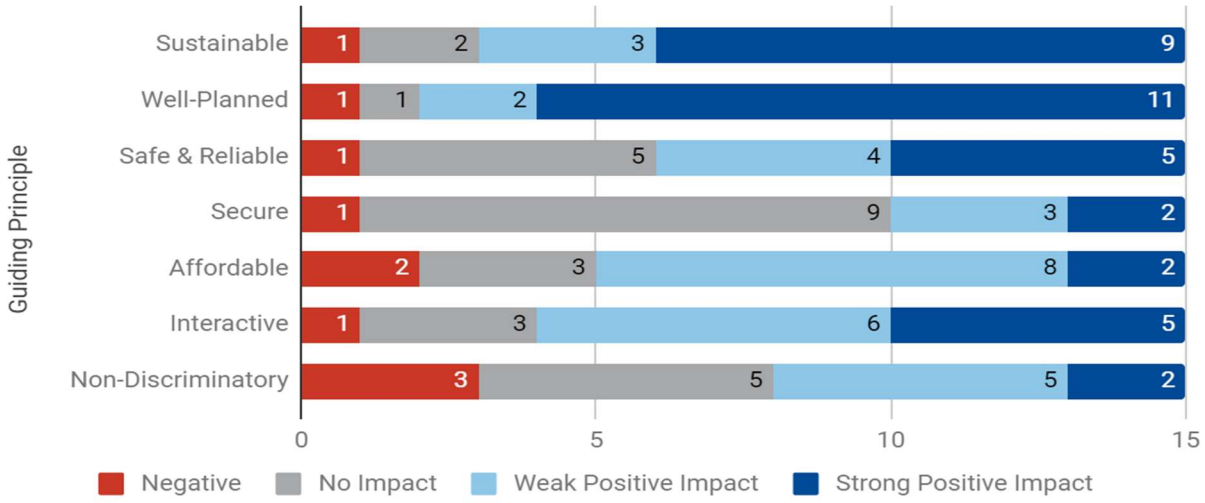


5.3.1 DCPSC to Reconvene Dynamic Pricing Working Group

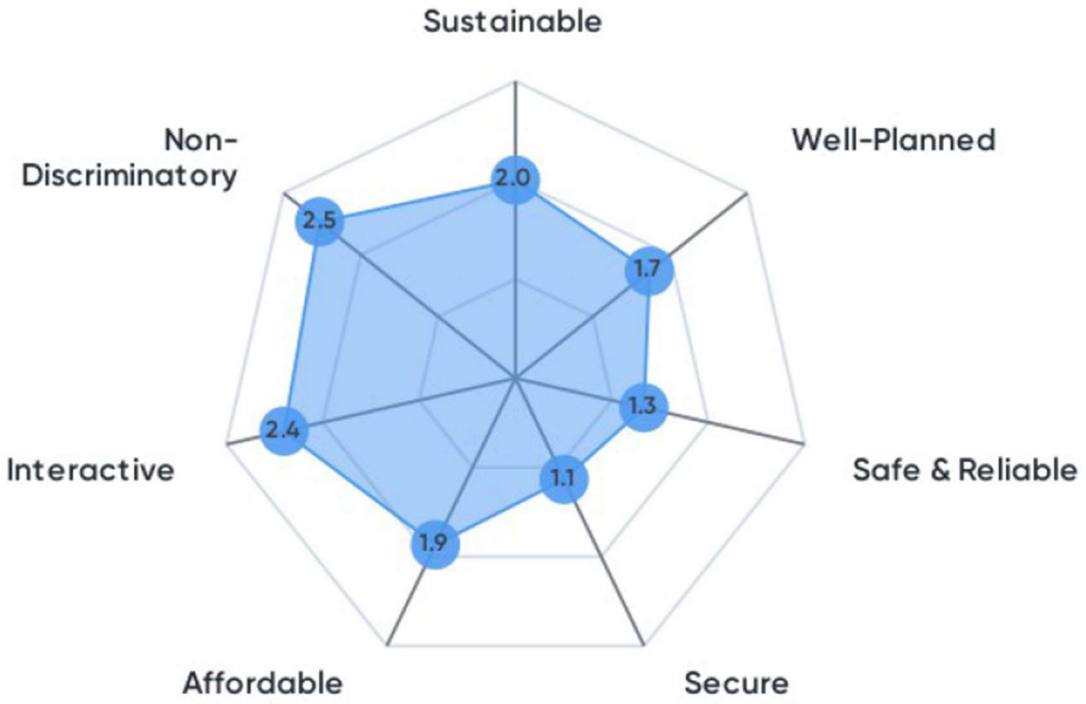


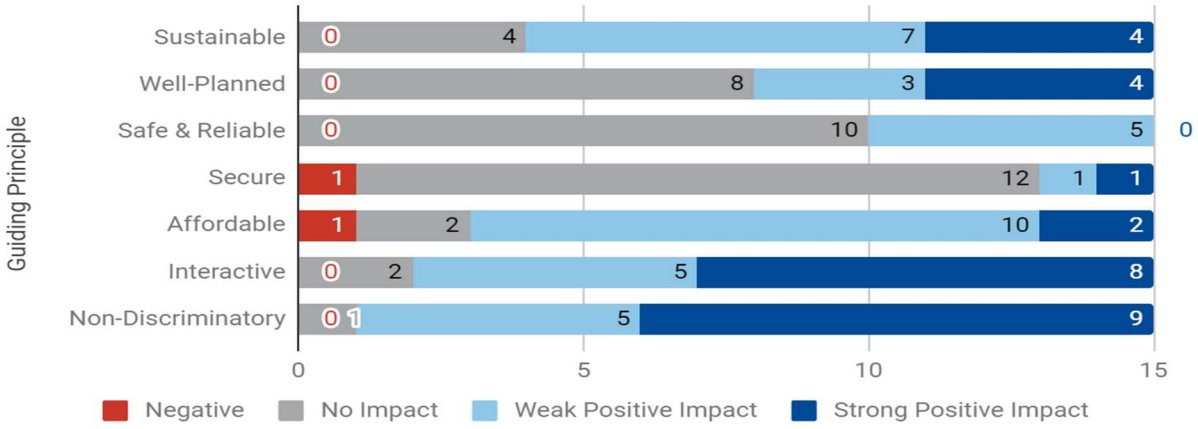
5.3.2 DCPSC to Initiate a Value of DER and Value of Grid Study



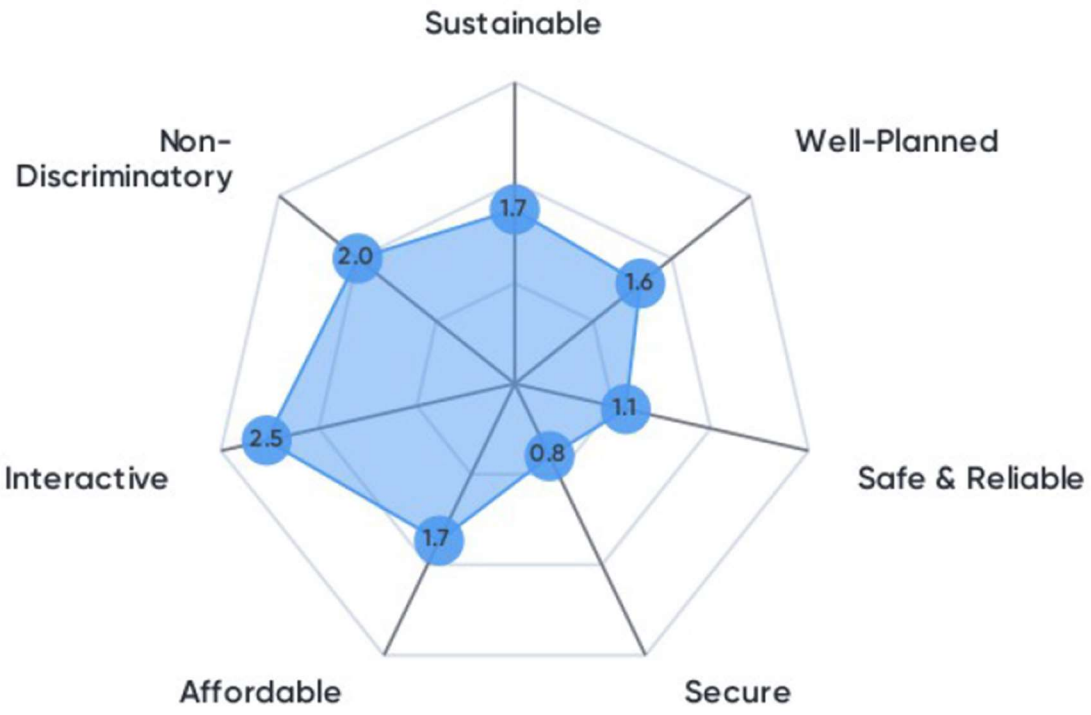


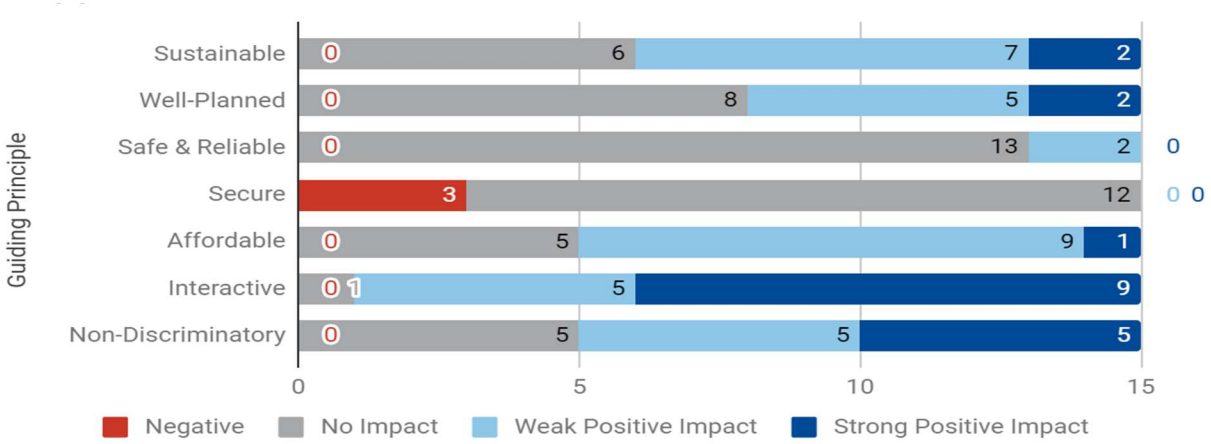
5.4.1 DCPSC to Enhance and Consolidate Customer Education Materials



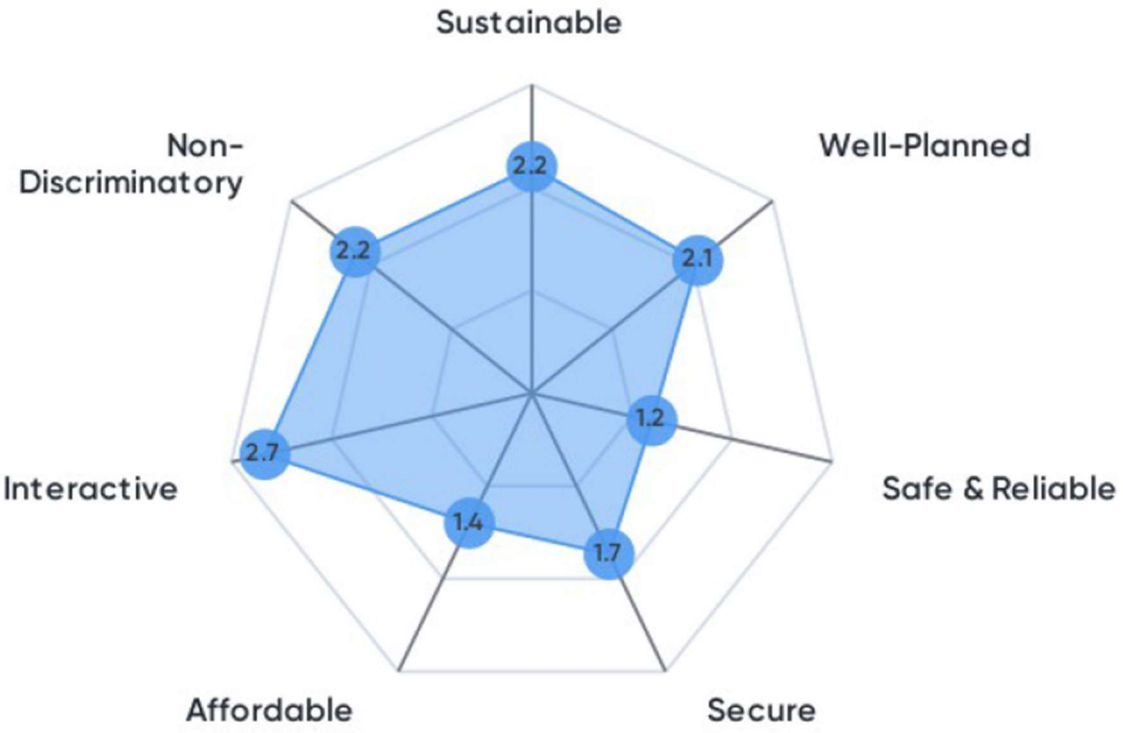


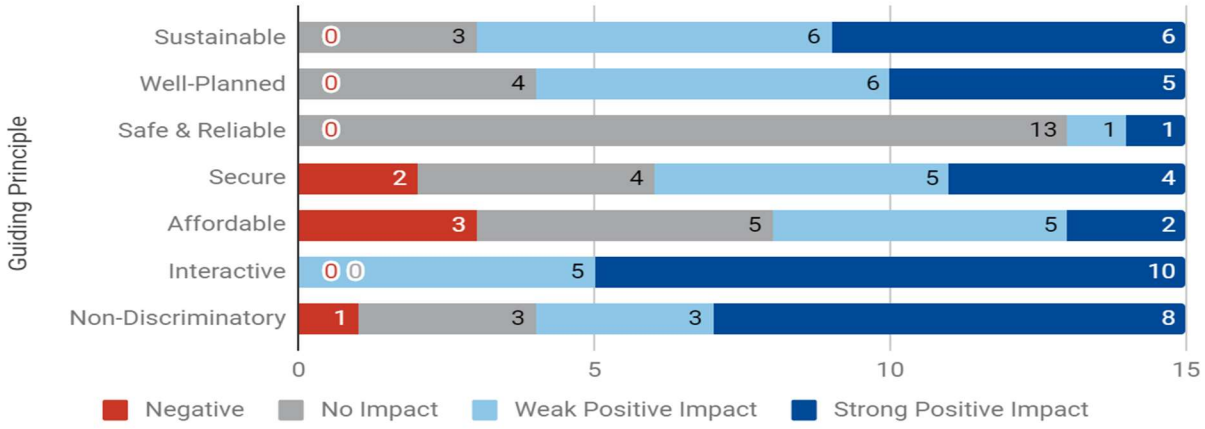
5.4.2 DCPSC to Enhance and Consolidate Competitive Energy Supplier Information for District Customers



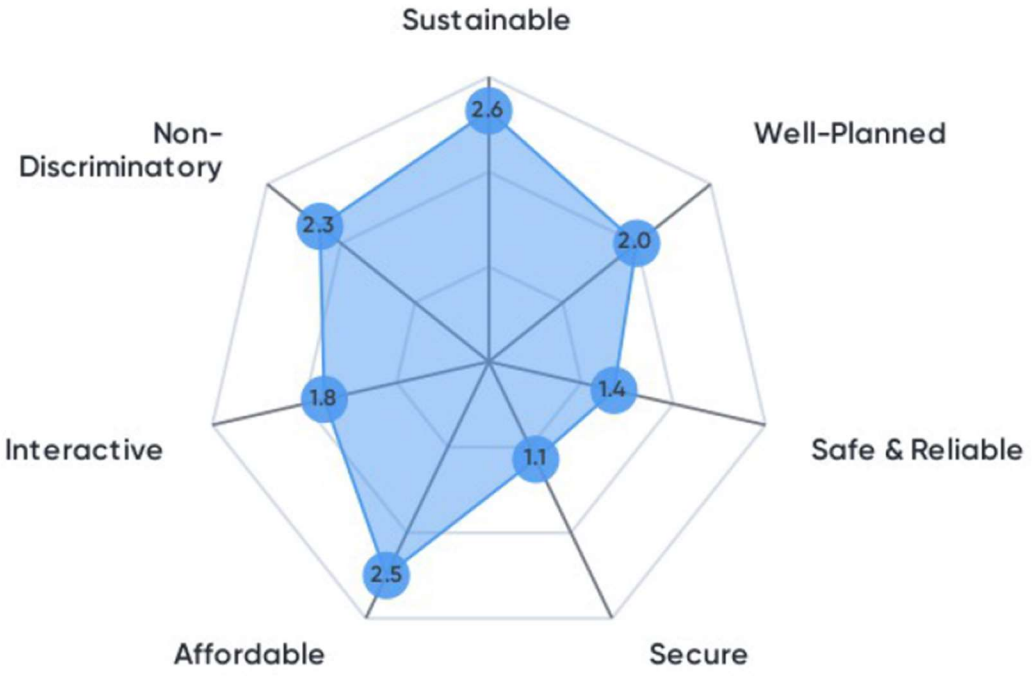


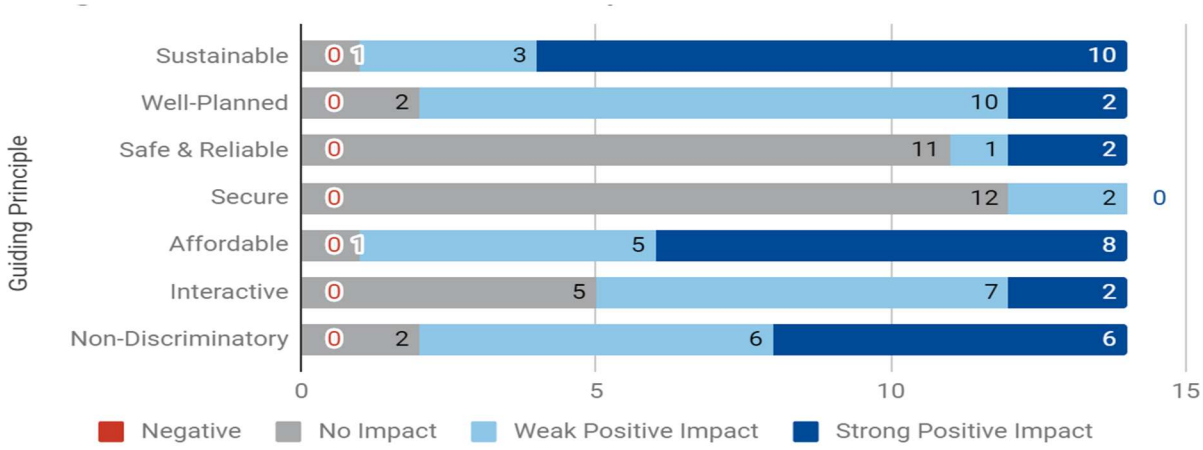
5.4.3 DCPSC to Work with Pepco to Enhance Customer Data Access and Protection



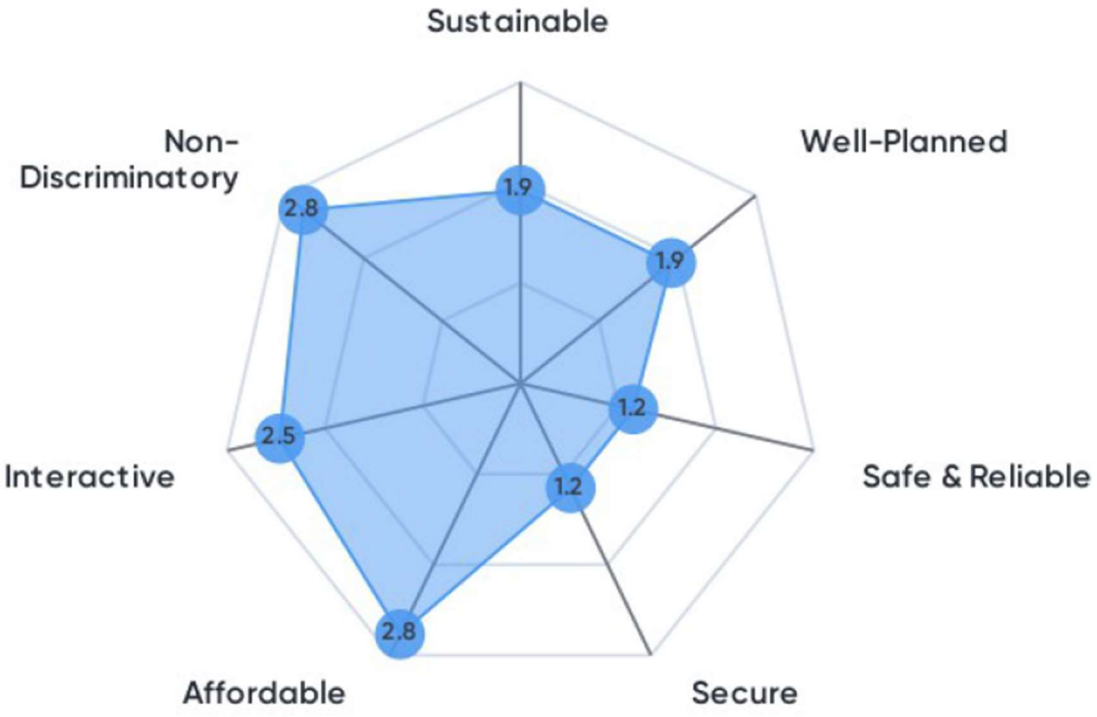


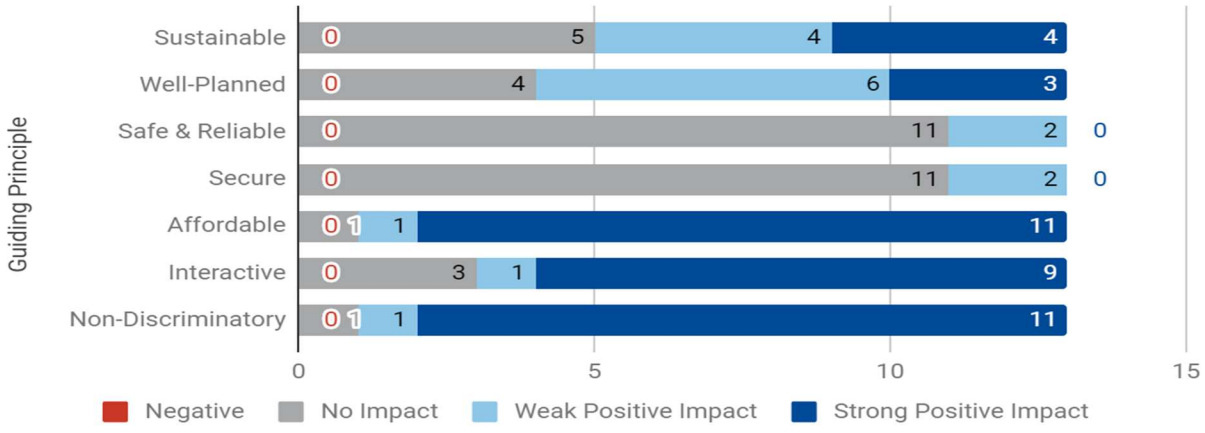
5.4.4 DCPSC to Direct Pepco to Develop Energy Efficiency Programs for Master Metered Apartments



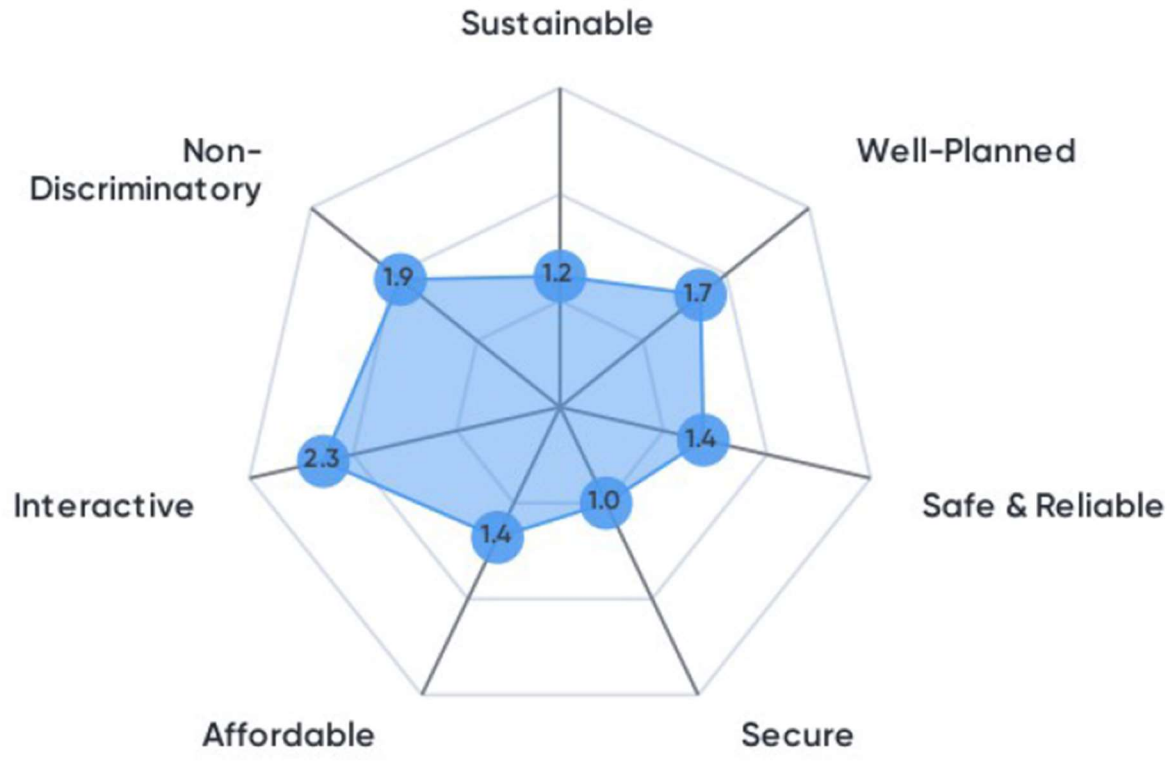


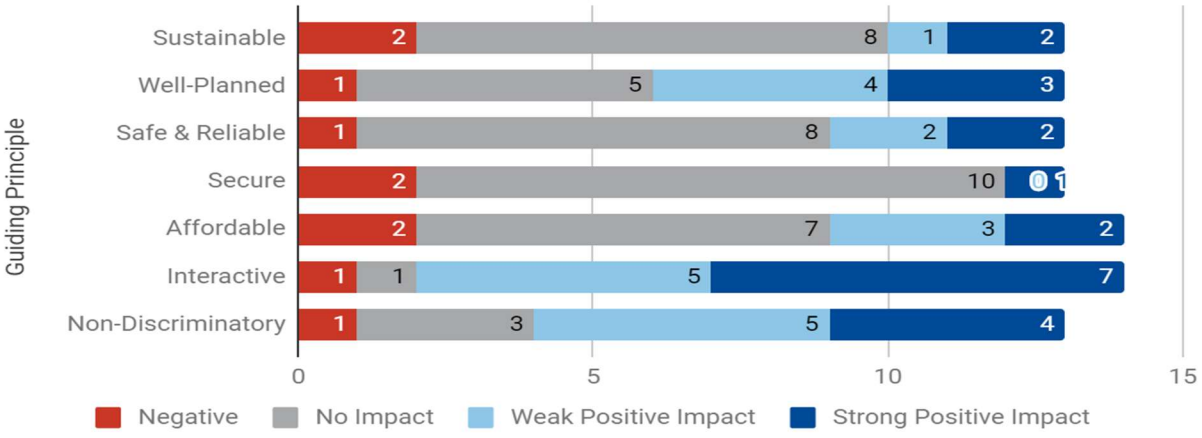
5.4.5 DCPSC to Support Customer Participation in Low-Income Programs



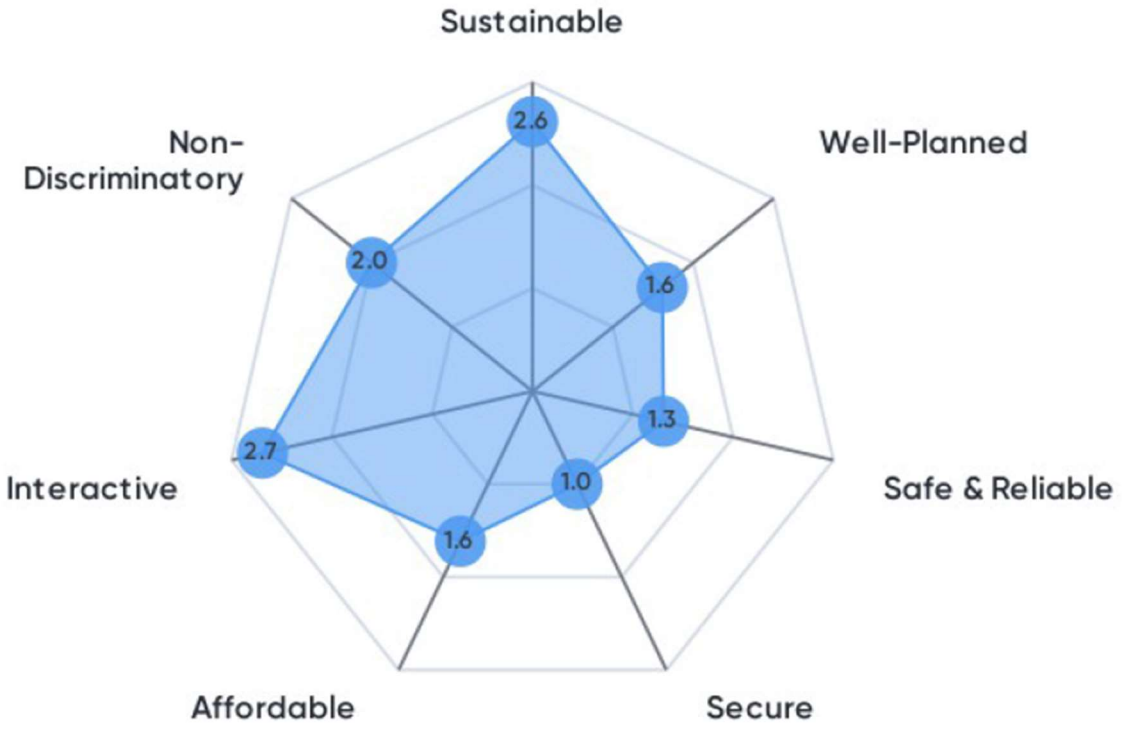


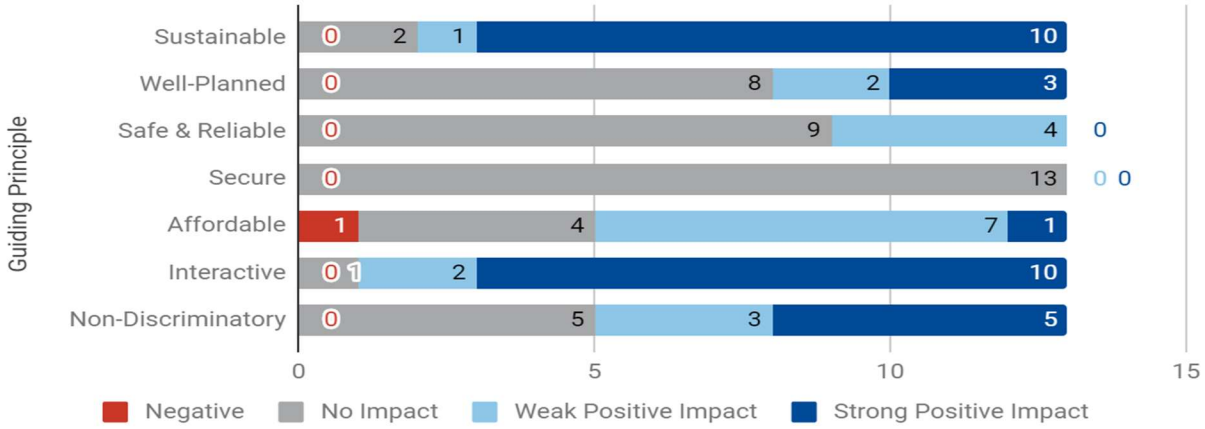
5.4.6 DCPSC to Revise CBOR Support the MEDSIS Pilots Projects Phase



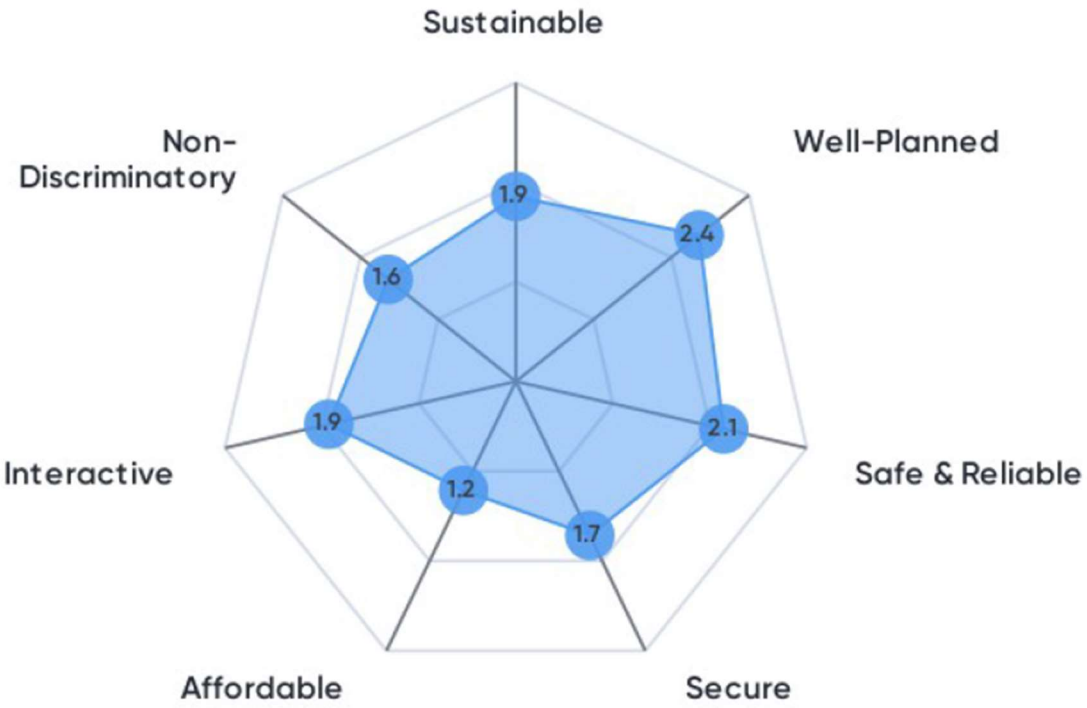


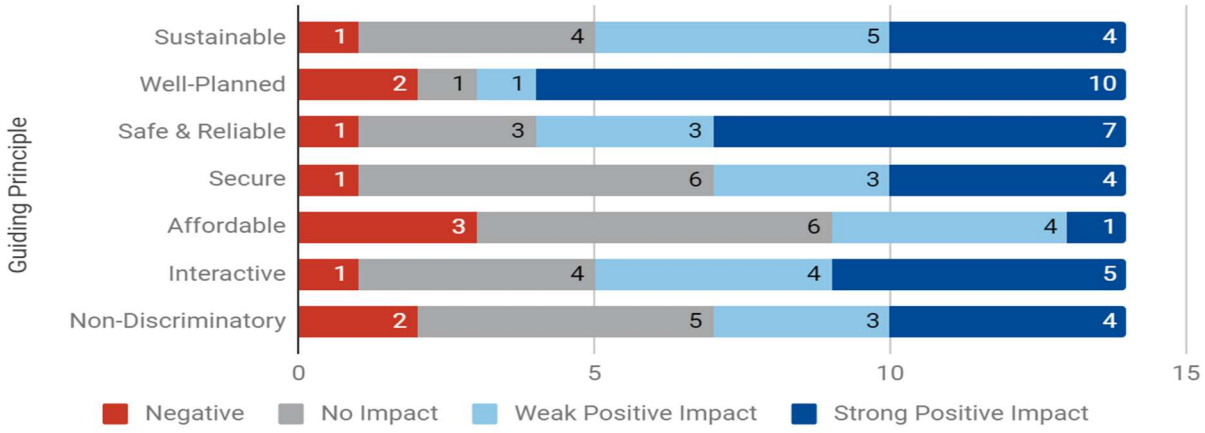
5.4.8 DCPSC to Ensure Connection between Customer Energy Usage and Their Environmental Impact



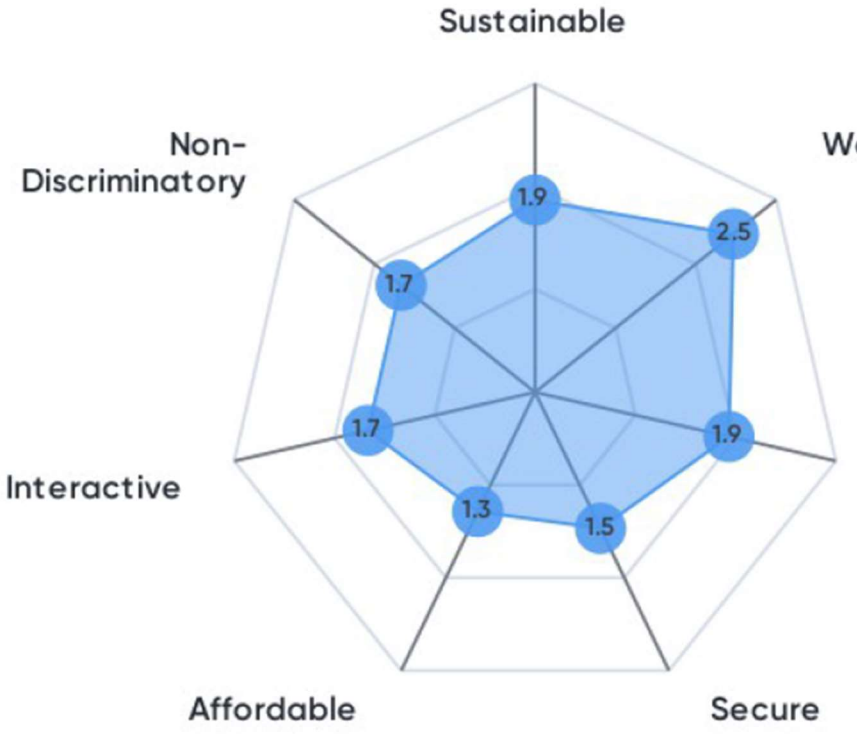


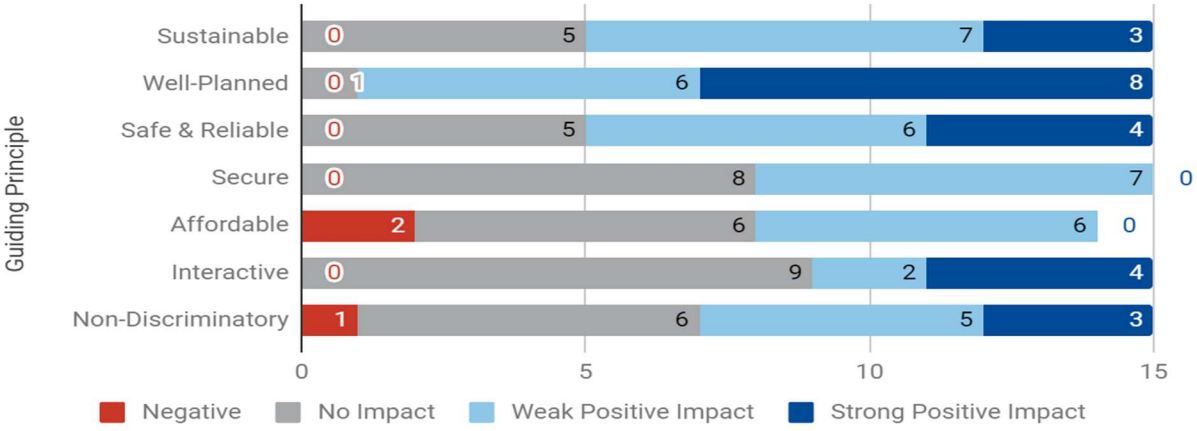
5.5.3 DCPSC to Establish New Regulated Entity of "Microgrid Operator"



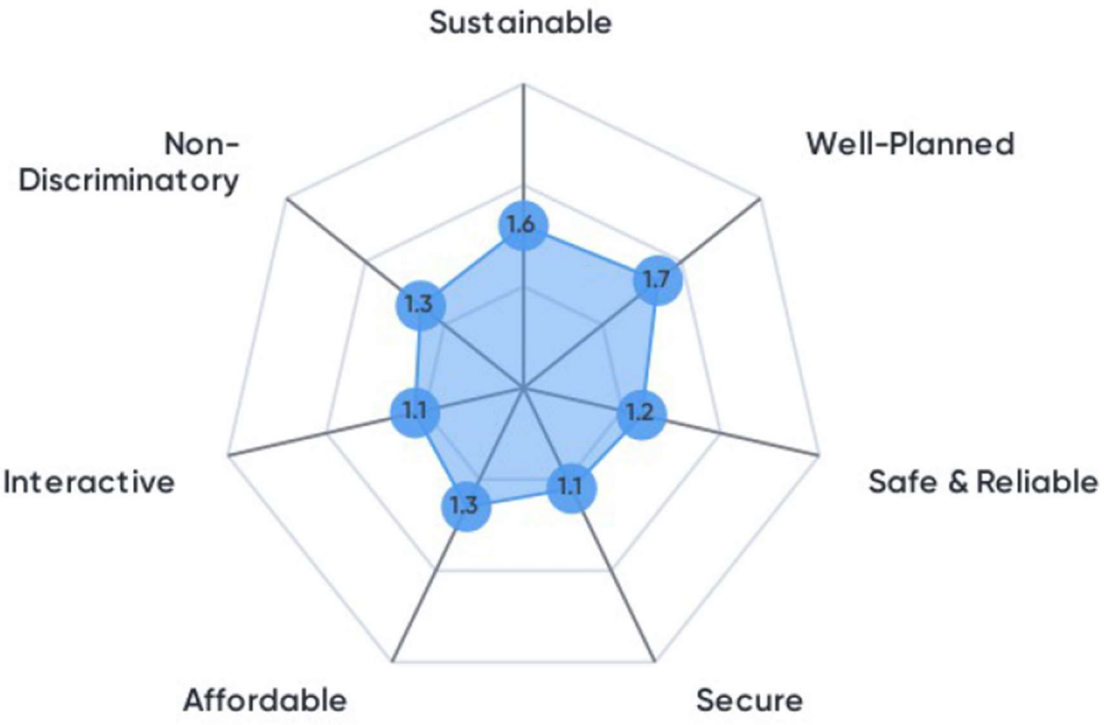


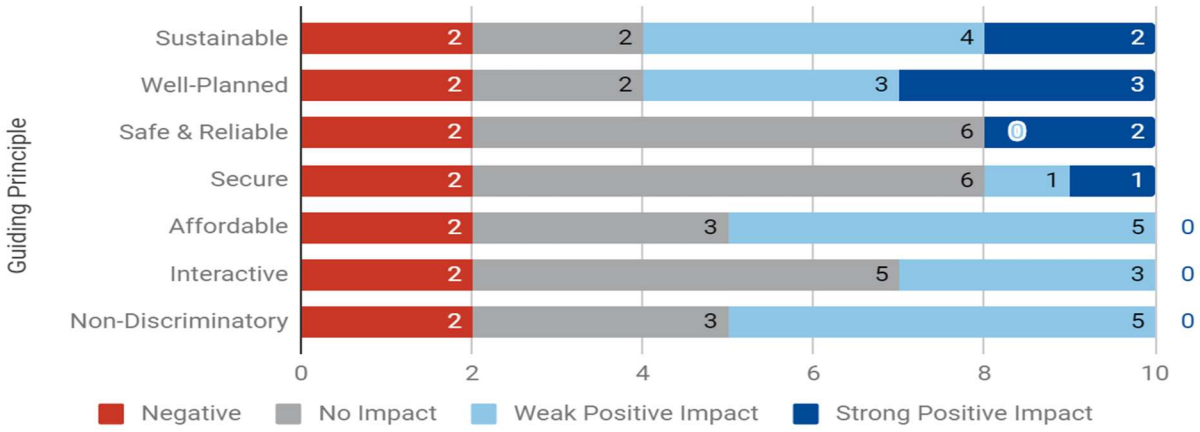
5.5.4 DCPSC to Direct the Utility to Establish a Customer Microgrid Schedule



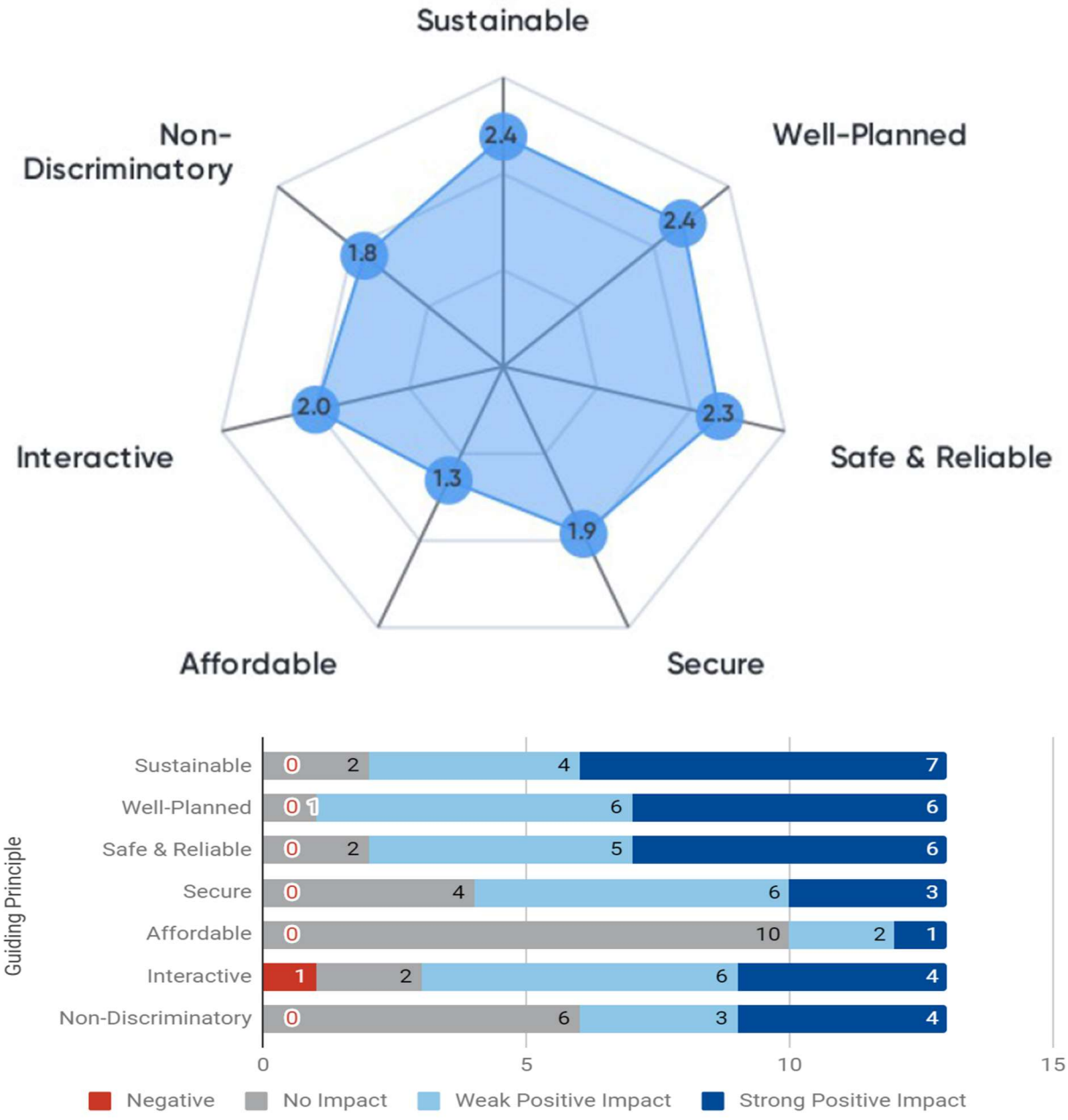


5.5.5 DCPSC to Determine How Utilities Recover Costs of Microgrid Assets

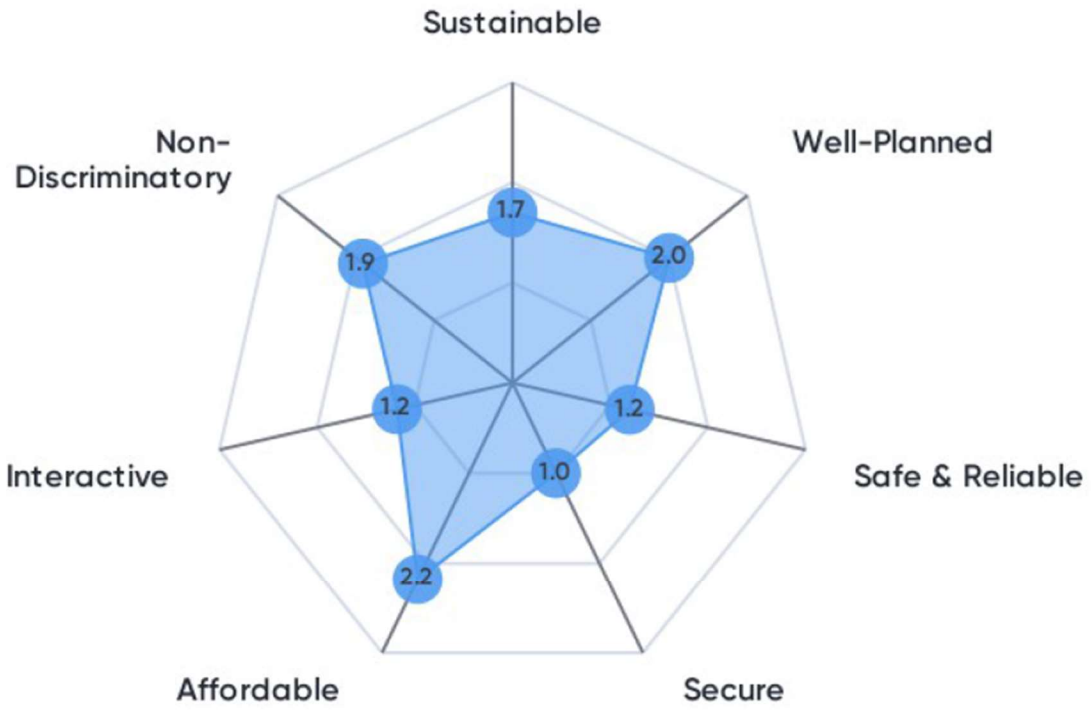


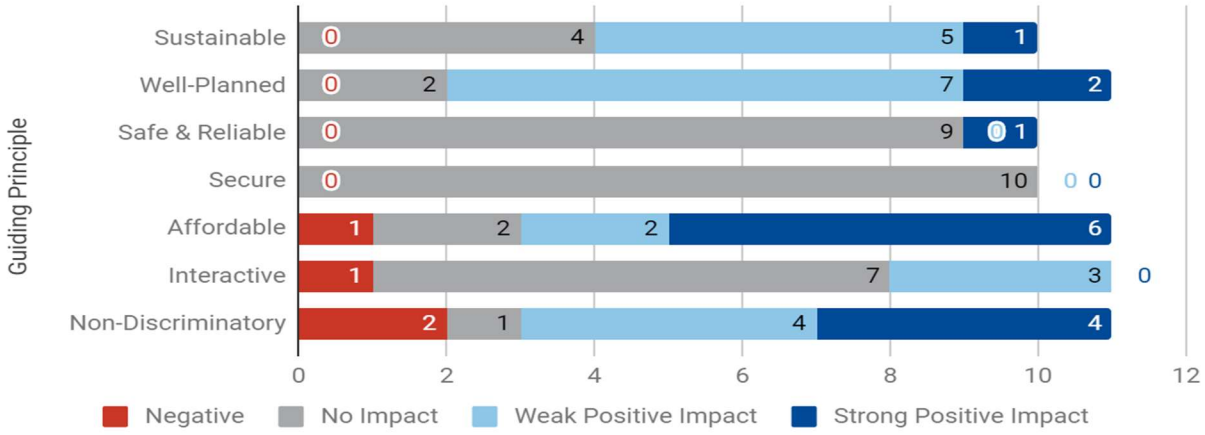


5.5.7 DCPSC to Amend Current Interconnection Rules to Address Interconnection and Islanding Rules for Microgrids and Storage



5.5.8 DCPSC/DC Council to Modify Methodology for Calculating DCPSC and DC Law Surcharges of District Customers' Bills





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