pepco
AN EXELON COMPANY

Dennis P. Jamouneau
Assistant General Counsel

EP9628
701 Ninth Street NW
Washington, DC 20068-0001

Office 202.428.1122
Fax 202.331.6767
pepco.com
djamouneau@pepcoholdings.com

October 31, 2025

Ms. Brinda Westbrook-Sedgwick
Commission Secretary
Public Service Commission
of the District of Columbia
1325 G Street, N.W. Suite 800
Washington, DC 20005

Re: Formal Case No.1167 15- Year CSP and Electrification Impact Study

Dear Ms. Westbrook-Sedgwick:

Attached are Potomac Electric Power Company's (Pepco) 15-Year Climate Solutions Plan (CSP) and Electrification Impact Study – Summary Report (Electrification Study) pursuant to Public Service Commission of the District of Columbia Order No. 22313. In addition, included as support for the Electrification Study is an appendix.

Please contact me if you have any further questions.

Sincerely,

/s/ *Dennis P. Jamouneau*

Dennis P. Jamouneau

Enclosures

cc: All Parties of Record

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Pepco DC Climate Solutions 15-Year Plan

October 2025

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Acronym List

Abbreviation	Meaning
ACC2	Advanced Clean Cars II
AMI	Advanced Metering Infrastructure
BCA	Benefit-Cost Analysis
BEPS	Building Energy Performance Standards
BESS	Battery energy storage system
BGE	Baltimore Gas & Electric
BIL	Bipartisan Infrastructure Law
BYOD	Bring-your-own-device
CCA22	Climate Commitment Act of 2022
CEDC Act	Clean Energy DC Omnibus Amendment Act of 2018
CREF	Community renewable energy facility
DC	District of Columbia
DCFC	Direct Current Fast Charger
DCSEU	DC Sustainable Energy Utility
DDOT	District Department of Transportation
DER	Distributed energy resource
DERMS	Distributed Energy Resource Management System
DOE	U.S. Department of Energy
DOEE	District Department of Energy and Environment
DR	Demand response
DSM	Demand side management
DSP	Distribution System Planning
EEDR	Energy efficiency and demand response
EIA	U.S. Energy Information Administration
EV	Electric vehicle
GHG	Greenhouse gas
GWh	Gigawatt-hour
HVAC	Heating, ventilation, and air conditioning
IDSP	Integrated Distribution System Planning
IIJA	Infrastructure Investment and Jobs Act
IoT	Internet of Things
IRA	Inflation Reduction Act
kW	Kilowatt
kWh	Kilowatt-hour
LED	Light emitting diode
LMI	Low- to moderate-income
LTE	Long-Term Evolution network
M&V	Measurement & verification
MRP	Multiyear rate plan
MW	megawatt
NWA	Non-Wires Alternative

NZE	Net zero energy
OBBBA	One Big Beautiful Bill Act
PG&E	Pacific Gas & Electric
PLUG	Power Line Undergrounding
PPA	Power purchase agreement
QHEC	Quick Home Energy Check-Up
R-AE	All Electric Residential rate
REC	Renewable energy certificate
R-PIV	Residential Plug-in Vehicle rate
RPS	Renewable portfolio standard
SCE	Southern California Edison
SDG&E	San Diego Gas & Electric
SOS	Standard Offer Service
TOU	Time-of-use
U.S.	*United States*
V2G	Vehicle-to-grid
V2X	Vehicle-to-everything
VPP	Virtual Power Plant
WMATA	Washington Metropolitan Area Transit Authority
ZEV	Zero emissions vehicle

Executive Summary & Reader Guide

Pepco DC (Pepco, the Company) presents its Climate Solutions 15-Year Plan as the latest installment in Formal Case No. 1167. The 15-Year Plan offers a suite of programs that target each segment of the District's economy and which may be deployed over time in order to advance the District's climate policy commitments. Similar to prior plans, Pepco endeavors to bring forward programs that offer a balanced approach with specific focus in the first five-year plan on keeping affordability front and center and offering solutions that reduce customer bills through more efficient usage or reducing system-wide demand, while ensuring safe and reliable utility service for District consumers. In accordance with Order 22313, the 15-Year Plan applies Pepco's 2021 Climate Solutions Plan framework to outline appropriate corresponding utility actions, in consideration of policy, regulatory, market, technology, and consumer trends over the intervening period. Beyond advancing climate milestones, the identified solutions further reflect the Company's view of responsible service including operational efficiency, safe and reliable power, modernized infrastructure, and effective customer participation.

Through a significant policy record, the District lays out a vision of decarbonization that is electrified, efficient, and powered by local resources. This vision requires a modern, flexible, and smart grid to effectively manage new loads, demand management strategies, distributed energy resources, and bi-directional power flows. Pepco recognizes its unique role as the "Connector" of customers, grid-edge assets, and utility resources in enabling this energy transition, as well as the opportunities and challenges presented. Importantly, participation of customers and third parties is essential to fully realize an advanced grid that is equipped to meet these challenges while maintaining service quality and keeping affordability front and center as the energy transition accelerates.

Pepco's solutions seek to enhance resource adequacy and affordability by mobilizing capital towards climate infrastructure and empowering customer energy management. In the near-term, the 5-Year Plan programs will accelerate adoption of commercially available technologies while leveraging proven best practices to increase adoption of efficient technology and leverage technologies to reduce load District-wide. As electrification accelerates, the 10-Year Plan presents programs to coordinate grid-connected technologies as tools to balance loads and optimize customer energy usage. Solutions in the 15-Year Plan will facilitate grid-edge customer participation and third-party investment necessary for meaningful decarbonization and cost-effective long-term system operations.

The 15-Year Plan contains three sequential five-year roadmaps of climate solutions programs. Each contains Pepco's four Strategic Portfolios covering core market segments, as established in the Climate Solutions Plan: transportation, built environment, distributed energy resources, and the distribution system itself. The 15-Year Plan includes nine Initiatives across the four portfolios. In total, there are 36 programs outlined in the 5-Year Plan, 41 programs in the 10-Year Plan, and 37 in the 15-Year Plan.

Programs identified in earlier planning horizons may be carried forward, continued with modifications, or phased out over time; many later programs are sequenced to build upon the progress of earlier climate solutions. The iterative nature of the three-year cycle established by Order 22313 creates opportunities to incorporate learnings into future updates, as well. While subject to evaluation under the Commission's Benefit-Cost Analysis (BCA) and subsequent regulatory approval, the identified programs are grounded in ongoing Pepco activities, peer utility precedent, and District climate projects established through other dockets. This foundation promotes actionability within a program's respective planning horizon to advance District climate goals.

Section 1 provides regulatory and policy context for Pepco's 15-Year Plan for climate solutions. Per Order 22313, the section evaluates relevant District and Federal legislation and Commission proceedings. In general, District legislation establishes local dynamics and sets milestones across each of the 5-year planning horizons and beyond. Meanwhile, Federal policy informs broader market trends which are reflected in the scope and sequencing of Pepco's climate solutions programming. Commission actions provide clear direction on climate-related initiatives, necessary precedent and approvals for the Company, and foundational infrastructure upon which the identified programs build.

Section 2 reviews the Climate Solution Plan framework as established by the Company in 2021, comprised of Pepco's Guiding Principles and Strategic Portfolios. The Strategic Portfolios identify market segments in which Pepco can appropriately and effectively develop programming to advance District climate policy. The Guiding Principles represent the broad outcomes which Pepco seeks to promote in selecting programs, informed by District and Commission directives. This section discusses the application of the Climate Solutions Plan to the current District regulatory, policy, and consumer environment: alignment with the BCA metrics as established by the Commission; support for current District decarbonization targets; and impact of prevailing market dynamics on decarbonization programming.

Section 3 outlines Pepco's philosophy in developing the 15-Year Plan, as well as the stakeholders that influenced it. The section defines Pepco as "the Connector" of grid-edge assets, and the types of activities and delivery strategies that may be offered as programs under that utility role. Programs are grouped by activity type and delivery strategy into Initiatives, which are articulated to achieve Strategic Portfolio goals. The section provides an action plan to implement 15-Year Plan programs in accordance with the Commission's processes for BCA evaluation, filing, approval, cost recovery, and impact reporting as established in Formal Case No. 1167. The action plan also identifies use of the BCA for program evaluation of customer bill impact, relative cost-effectiveness, and greenhouse gas (GHG) emissions reduction.

Section 4 details the intended contribution of each Strategic Portfolio toward Pepco's Guiding Principles and vision for the grid in enabling decarbonization in the District. Specifically, the section discusses local dynamics, equity considerations, and industry and technology trends which influence the identification and sequencing of programming

within a given Strategic Portfolio. The section identifies specific District climate milestones enabled by a given Strategic Portfolio in each of the 5-year planning horizons. Per Order 22313, the section discusses how programs within each Portfolio may reduce Scope 1, 2, and 3 GHG emissions.

Sections 5, 6, and 7 comprise the 5-, 10-, and 15-Year Plans, respectively. Each section provides a roadmap of climate solutions programs which Pepco may further develop and implement within that 5-year period to accelerate decarbonization in the District, subsequent to benefit-cost analysis and subject to Commission approval. Sections 6 and 7 also identify those programs from earlier Plans to be continued though that planning period. Each section is organized by Strategic Portfolio and subdivided by Initiative. Each Plan, and the programs which comprise it, builds toward specific outcomes and District milestones within the period. They further set the stage for Pepco's ultimate vision of the grid as a decarbonized, modern energy platform to enable the energy transition. The 5-Year Plan builds a foundation of Pepco's principles of reliability, affordability, and equity & inclusion. These Guiding Principles are reinforced as the 10-Year Plan accelerates interactivity between customers, smart assets, and the grid. The 15-Year Plan seeks to establish environmental and economic sustainability for the utility and District customers.

1. Introduction

The Company's Climate Solutions Plan establishes an overarching vision and framework of Pepco's role in advancing decarbonization and the energy transition in the District, in consideration of District policy, Commission direction, and consumer and technology trends. Filed in 2021, the document outlines Pepco's strategy to ready and leverage the distribution system for electrification, distributed energy resource (DER) integration, and to address resource adequacy across four defined market sector portfolios, enabling an integrated approach to decarbonization that empowers all customers to participate in climate solutions. To mature and realize this vision, Pepco has prepared this Climate Solutions 15-Year Plan, in accordance with Order Nos. 22313 and 22339. The 15-Year Plan identifies and sequences actionable Company initiatives and programs to serve as a roadmap towards both the Climate Solutions Plan vision as well District milestones on the path to carbon neutrality. In doing so, the living framework of Strategic Portfolios and Guiding Principles established in the 2021 Climate Solutions Plan is adapted to reflect the evolving demands of the electric utility in today's environment.

In the near-term, identified solutions include foundational policy, capabilities, and infrastructure at both the customer and grid levels. Programs in the upcoming 5-Year Plan period are informed by current utility efforts and market conditions, and promote select Guiding Principles to address the most pressing needs for safe and reliable electric service such as resource adequacy. Over the full planning horizon, the 15-Year Plan takes a balanced approach to connect industry-leading technologies and utility programming in service of broader grid modernization and decarbonization goals. The 15-Year Plan will guide tangible action by the Company in accordance with Commission directives to deliver equitable climate solutions that promote safety, reliability, and cost reasonableness for customers in the District.

1.1. Background

In Order No. 20662, dated November 18, 2020, the Public Service Commission of the District of Columbia (the Commission) opened Formal Case No. 1167 to consider whether, and to what extent, utility or energy companies are advancing the District's energy and climate goals and take action, where necessary, to guide the companies in the right direction.

In Order No. 20754 under Formal Case No. 1167, dated June 4, 2021, the Commission directed Pepco to make numerous filings, including (1) a high-level Climate Change Commitment strategy (including the related climate and clean energy strategy and plans); (2) an electrification study; (3) a proposal to implement the Climate Change Commitment; (4) a list of proposed programs and initiatives that Pepco has already filed or intends to file, as part of its overall Climate Change Commitment plan, over a short term (5-year) horizon and long term (30-year) horizon; and (5) with respect to the proposed programs and initiatives, the potential application of utility-sponsored DERs, including, but not limited to energy efficiency, demand response (DR), and energy storage programs.

Pursuant to Order Nos. 20662 and 20754, Pepco filed the following:

1. DC Climate Solution Plan, filed July 20, 2021
2. An Assessment of Electrification Impacts on the Pepco DC System, filed August 27, 2021
3. 5-Year Action Plan, filed October 8, 2021
4. 30-Year Transition Strategy and Long-Term Outlook at the Development of Climate Solutions in the District of Columbia, filed November 30, 2021
5. Climate Solutions 5-Year Action Plan: Benefits and Costs, filed January 31, 2022

In Order No. 22313, dated October 10, 2024, the Commission directed Pepco to update their Climate Solutions Plan and prepare a new 15-Year Plan filing in consideration of (1) new legislation adopted by the District since Pepco's initial filings, as well as relevant Commission filings; (2) relevant analysis in lieu of ongoing Benefit-Cost Analysis (BCA) development under GM2019-04-M; and (3) recent market, technology, and consumer trends since initial Climate Solutions Plan filings. Order No. 22313 also directed Pepco to provide an informational report that updates the status of the 15-Year Plan once every three years starting February 15, 2028. On December 10, 2024, the Commission issued Order No. 22339, which modified certain aspects of Order No. 22313 in response to requests for reconsideration. While the order reaffirmed the directive for Pepco to submit a new 15-Year Plan and an updated electrification study, it rescinded the requirement to file an updated Climate Solutions Plan at this time.

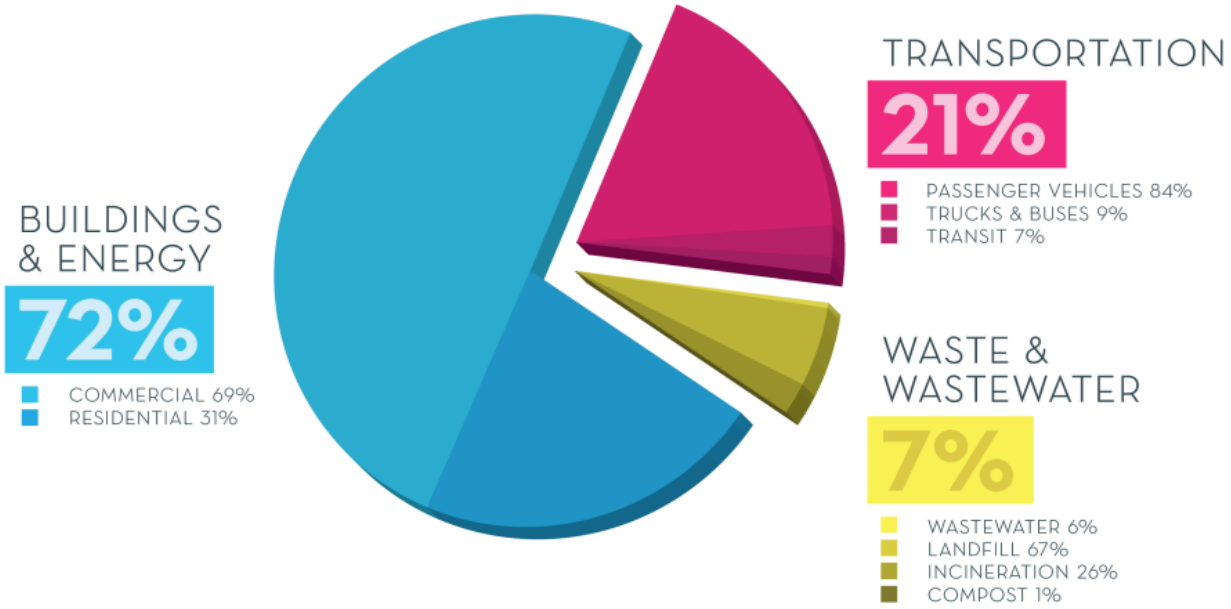
In accordance with Order Nos. 22313 and 22339 and the Company's 2021 Climate Solutions Plan, the Company has prepared this 15-Year Plan (the Plan). This document incorporates relevant impacts to Company programs and to customers resulting from recent District and Federal legislation, Commission policy, findings of previously completed analysis, and changes in market conditions. The 15-Year Plan supersedes the previous 5-Year Action Plan and 30-year Transition Strategy.

1.2. Relevant District & Federal Policy

The District of Columbia has established a path to reach carbon neutrality as well as prepare the District to withstand the impacts of and adapt to climate change. According to the Department of Energy and Environment's (DOEE) most recent greenhouse gas (GHG) inventory,[1] the main sources of emissions in the District are buildings, transportation, and waste. Among those sectors, buildings accounted for 72% of District-wide emissions, followed by transportation at 21% and waste at 7%. In 2022, across fuel source emissions, electricity accounted for 46%, natural gas for 26%, and gasoline for 18%. See Section 2.4 for further discussion of District electricity consumption trends.

[1] DOEE Greenhouse Gas Inventories

2022 District GHG Emissions by Sector



Source: DOEE Greenhouse Gas Inventories

Climate and energy policy in the District is primarily set by the landmark Clean Energy DC Omnibus Amendment Act of 2018 (the CEDC Act), which establishes a broad range of aggressive targets related to emissions reductions, 100% renewable energy supply (including interim goals and minimums from local solar), building and energy efficiency standards, and transportation electrification to achieve carbon neutrality. To this end, the District has dedicated significant planning and resources to present a vision to reach the District's overarching GHG emissions reduction and clean energy goals with actions targeting key GHG-emitting sectors and activities. That vision is captured in several legislative measures passed by the Council of the District of Columbia and approved by the Mayor as well as reports produced by District agencies, each with specific sub-goals and benchmarks that form a basis of action toward an overall carbon neutrality goal. These include Clean Energy DC 2.0 (draft as of 2023, expected 2025), Carbon Free DC (2023), Resilient DC (2019), and Sustainable DC 2.0 (2019).

Order No. 22313 identifies District and Federal legislation adopted since the opening of Formal Case No. 1167 and the development of the Climate Solutions Plan, which are considered in the Company's identification of climate solutions:

1. ***Climate Commitment Act of 2022,*** (CCA22), which accelerates District GHG emissions reductions targets to (a) reduce emissions by 60% by 2030 (versus 50% by 2032), and (b) achieve carbon neutrality in the District by the year 2045 (versus 2050 as initially established by the CEDC Act), as well as establishing Building Energy Performance Standards (BEPS);

2. ***Clean Energy Building Code Amendment Act of 2022****,* which establishes standards for new buildings and major renovations to meet net zero energy (NZE) standards, and applies these standards to all new construction after 2026;

3. ***Local Solar Expansion Amendment Act of 2022****,* which increases the renewable portfolio standard (RPS) from 10% to 15% by 2041 for in-District solar projects eligible for Solar Renewable Energy Certificates;

4. ***Healthy Homes and Residential Electrification Act of 2024****,* which directs DOEE to provide residential electrification retrofits at no cost to low-income households and qualifying multifamily housing buildings;

5. ***Infrastructure Investment and Jobs Act*** (IIJA), also known as the ***Bipartisan Infrastructure Law*** (BIL), which was enacted in 2021 to establish $1.2 trillion in Federal funding through 2026 in repair and modernization of infrastructure, including public transportation electrification, alternative fueling, and electric grid renewal; and,

6. ***Inflation Reduction Act of 2022*** (IRA), which established various Federal incentives to support commercial and residential clean energy, electric vehicles (EVs), building efficiency, and emissions reductions via tax credits as well as funding specifically for low-income communities.

Further, the District's Electric Vehicle Readiness Amendment Act of 2020 requires make-ready infrastructure to support future EV charging at all "new construction or substantial improvement of commercial buildings."[2] In 2023, the District also adopted California's Advanced Clean Cars II (ACC2) vehicle emission standards which serve to further accelerate zero-emission vehicle (ZEV) transition in the District.

Despite supportive District policy, Federal programs for renewable energy, EVs, and energy efficiency have been subject to significant shifts in funding and U.S. Administration

[2] D.C. Law Library - D.C. Law 23-194. Electric Vehicle Readiness Amendment Act of 2020.

support. In July 2025, H.R. 1 (the "One Big Beautiful Bill Act," or OBBBA) was signed into law, terminating many Federal energy incentive programs and energy tax credits, with some changes taking effect as early as September 2025. At the same time, January 2025 Executive Order 14154: Unleashing American Energy[3] emphasizes domestic energy affordability and reliability. Taken together, the current Federal landscape underscores the importance of Pepco's leading role in providing solutions that promote safe, reliable, and affordable electric service, activate investment in local energy works, and advance District climate policy.

1.3. Relevant Commission Actions

The Commission has a long track record of guiding the development and implementation of the District's clean energy and climate policies. Preceding Formal Case No. 1167, the Commission considered and approved several initiatives and policies that form essential building blocks for Pepco's Climate Solutions Plan. Pepco's 15-Year Plan is intended to align with and incorporate the Commission's direction, policy, and approved projects in these areas, thereby advancing the established record while responding to the challenge of the District's specific climate goals.

In particular, the Commission has taken recent action on the following matters, which are considered in the 15-Year Plan's proposed programs:

1. ***Energy Efficiency (Formal Case No. 1148/1160)****:* The Commission issued Order No. 19145 under Formal Case No. 1148 in 2017 which directed implementation of energy efficiency and energy conservation programs targeted to affordable multifamily units and master metered multifamily buildings that include low- and limited-income residents using $11.25 million from Pepco merger commitments. Program implementation began in early 2021 and has since been completed. Under Formal Case No. 1160, the Commission issued Order No. 20654 to create parameters for Pepco's three-year energy efficiency and demand response (EEDR) program, with an emphasis on low-income customer programs. Following partial approval of Pepco's EEDR program filing, the Commission rescinded approval in October 2022**.** Programs developed in accordance with Commission parameters for energy efficiency remain on hold subject to completion of the BCA and subsequent Commission approval.

2. ***Streamlined Interconnection (RM9/RM40, Formal Case No. 1050):*** In 2018, the Commission initiated a proceeding to continue to streamline the interconnection process for net energy metering and community renewable energy facilities (CREFs) and to increase the amount of generation eligible for net energy metering. The current rulemaking for interconnection standards was approved by Formal Case No. 1050-279 in August 2021.

3. ***Renewable Power Purchase Agreement (Formal Case No. 1017, RM41):*** In 2019, Order No. 19897 directed the development of a 15- to 20-year wind or solar power purchase agreement (PPA) to procure a target 5% of Standard Offer Service (SOS)

[3] Unleashing American Energy

load by 2024. The Company's first long-term renewable energy PPA was approved in August 2022. While that PPA was terminated, the Commission recently approved Pepco's second executed PPA in Order No. 22702.

4. ***Transportation Electrification (Formal Case No. 1130/1155, Bill 25-0106):*** In 2019, the Commission, in Order Nos. 19898 and 19983, authorized Pepco to provide make-ready infrastructure to support public charging, taxi/rideshare and bus charging as well as a residential EV whole house time-of-use (TOU) rates. Pepco's EV Phase 1 program portfolio was launched in March 2020DC Bill 25-0106 was passed in November 2024 and requires DOEE to implement EV programs by January 1, 2026.

5. ***Clean Energy Benefit-Cost Analysis and Metrics (GD-2019-04)****:* In 2019, the Commission initiated a proceeding to support decarbonization and clean energy projects and programs required by the CEDC Act by establishing a BCA framework, metrics, and reporting. Order No. 21938 establishes the metrics to be monetized under the BCA, which includes the following "difficult to quantify" items to be monetized in Part B: GHG emissions; reliability; resilience; public health; low-income impacts; moderate-income impacts; racial equity; energy burden; and locational and temporal value of DER.

6. ***Distribution System Reliability and Resiliency (Formal Case No. 1144):*** The Company's Capital Grid Project long-term plans to improve and modernize the distribution system were approved to move ahead in 2019, including now-complete construction of the new Mount Vernon substation as well as ongoing District-wide transmission upgrades, undergrounding, and networking.

7. ***Integrated Planning & Grid Modernization (Formal Case No. 1130)****:* In 2020, the Commission established the Distribution System Planning (DSP)/Non-Wires Alternative (NWA) Process, integrating assessment of third-party DERs into the electric utility planning process. The PowerPath DC docket establishes a significant Commission record on the topic of grid modernization – including renewable energy integration and customer energy management.

8. ***Residential Time-of-Use Rates (Formal Case No. 1130)****:* In 2020, Order No. 20286 directed Pepco to file a proposal for Residential TOU rates to help reduce peak load. A Residential TOU rate for EV owners with charging stations was approved under Pepco's EV Phase 1 portfolio.

9. ***Demand Response (Formal Case No. 1130 and Formal Case No. 1086)****:* In 2020, the Commission, in Order No. 20286, initiated a proceeding that will result in the implementation of a dynamic pricing program to shave peak load. Pepco also currently operates a direct load control program, which was approved in 2011 in Order No. 16602.

10. ***Microgrids (Formal Case No. 1163, RM48-2022-01)****:* In 2020, the Commission issued a Notice of Inquiry to understand the benefits of microgrids to and potential

impacts of microgrids on the distribution system and microgrid and system customers. The Commission established rules governing microgrids in 2022 and recently issued a Notice of Proposed Rulemaking that would establish new rules for multi-customer microgrids.

11. ***Storage and DER (Formal Case No. 1166):*** In 2020, the Commission issued a Notice of Inquiry to understand perspectives on energy storage and other DERs.

12. ***Net Energy Metering & Community Solar (RM9):*** In 2020, the Commission amended Net Energy Metering rules to provide a path to allow customers to export up to 100% equivalent of their consumption by 2024. The rulemaking also provides regulatory support for CREFs, including virtual CREFs, as established in the District under the Community Renewable Energy Act of 2013. These provisions support increased local solar power deployment in the District.

13. ***Renewable Energy Portfolio Standard (RM29):*** The Commission adopted final revisions to RPS rules in 2020 in accordance with the CEDC Act. This includes streamlined certification of renewable energy facilities to contribute towards the RPS.

14. ***Multiyear Rate Plan/Performance Incentive Mechanisms (Formal Case No. 1156)****:* In 2021, Order No. 20755 approved a multiyear rate plan (MRP) that allows Pepco to align its financial planning with District policy goals and performance incentive mechanisms that support the District's goals regarding GHG emission reductions, transportation electrification, renewable energy development, grid modernization, etc.

15. ***Climate Ready Pathway Rate Planning (Formal Case No. 1176)****:* In 2024, the Commission approved the Company's second MRP on an extended pilot basis. The forward-looking MRP outlines investments the Company will make to support a more reliable, resilient grid and enable cleaner energy programs and technologies that support the District's goals. The plan also includes measures to expand assistance to help manage the affordability of energy service for customers.

16. **Integrated Distribution System Planning (Formal Case No. 1182)**: In 2024, the Commission invited comments on integrated distribution system planning (IDSP), which focuses on optimizing and modernizing the electric system to meet demands and District climate commitments, including electrification and resultant load increases. In addition to traditional distribution planning, IDSP emphasizes advanced technologies, data analytics, and DERs. In 2025, the Commission indicated that it will begin a working group process to discuss these issues with a report due in 2026.

17. ***DC Power Line Undergrounding (DC PLUG)****:* DC PLUG is an approved multi-year power line undergrounding project to improve electric distribution system resilience and reduce outages during severe weather events. The initiative is a partnership between Pepco and District Department of Transportation (DDOT). It is subject to a

triennial project planning and review process by the Commission and slated for completion by 2029.

The Commission's direction in Formal Case No. 1167 Order Nos. 20662, 20754, 22313, and 22339 builds on this substantial record within the specific context of the District's carbon neutrality goal. Those orders direct the submission and evaluation of climate change plans from the District's electric and natural gas utility companies.

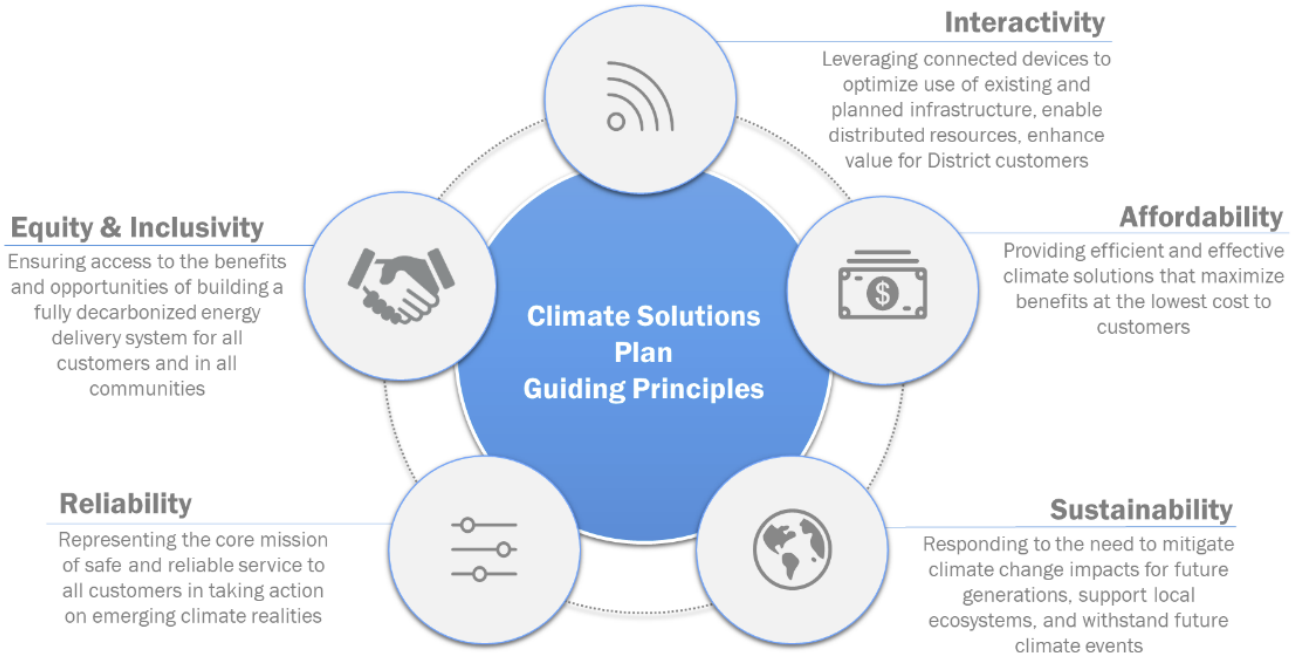
In the sections below, the Company lays out the actions proposed over the next 15 years in agreement with current Commission orders and relevant legislation.

2. Pepco's Climate Solutions Plan

In the increasingly electrified and interconnected future that the District envisions, the transition from fossil-based electricity to 100% renewable energy will occur by 2032, and this decarbonized electricity will be used to efficiently power as much of the District's economy as possible. This shift will increase utilization of the underlying electric system by dynamic loads, requiring the system to become increasingly smart and flexible over time. As outlined in established District and Commission policy, this transition requires both supply- and demand-side changes, which will require investment in the grid to adapt while continuing to provide safe and reliable service.

In response to Order Nos. 20662 and 20754, Pepco filed its Climate Solutions Plan in July 2021 under Formal Case No. 1167. The Climate Solutions Plan outlines the utility's role and strategy as the "Connector," providing and facilitating an interactive platform to support the District's decarbonization goals and energy policies. In alignment with District policy, the Climate Solutions Plan presents an electrification- and efficiency-based approach to decarbonization in the District which leverages an increasingly renewable electricity supply and integrated grid-edge technologies.

Pepco's Climate Solutions Plan Guiding Principles



Source: Pepco Climate Solutions Plan

Pepco's Climate Solutions Plan promotes a cross-segment approach through a collaborative regulatory process; activation of third parties complementary to Pepco's utility function; removal of barriers and inequities in broad electrification; and support for continued investment into the distribution system. As detailed in this section, the Climate

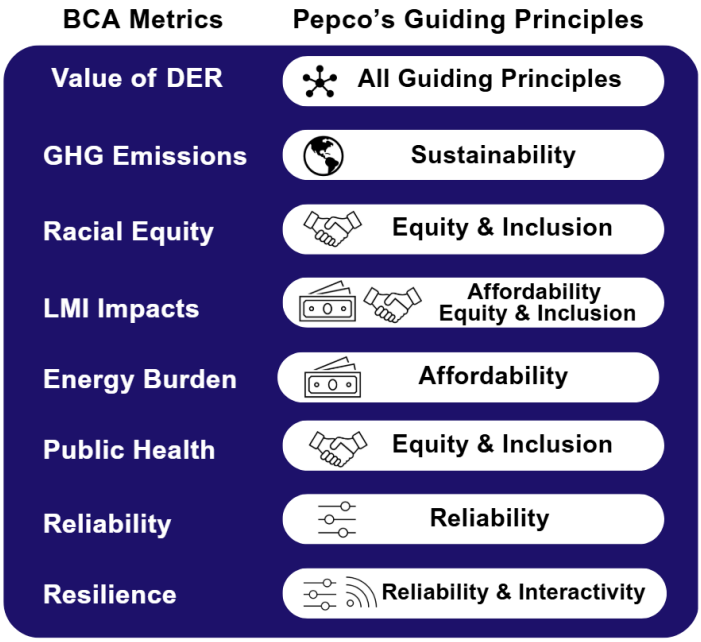
Solutions Plan provides a defined yet flexible framework for outlining Company actions to meet the District's climate and clean energy goals. As such, the Climate Solutions Plan is not intended to be updated at this time, and this document does not serve to update the Climate Solutions Plan. Rather, the Climate Solutions Plan provides the foundation on which the Company's 15-Year Plan is developed in consideration of current policy and market conditions.

2.1. Climate Solutions Plan Guiding Principles

The Company has established five Guiding Principles that underpin the Climate Solutions Plan and provide a foundation for evaluating, selecting, and designing programs outlined throughout this 15-Year Plan. The Guiding Principles include **affordability, reliability, equity and inclusion, interactivity, and sustainability,** which are directly reflective of Commission and District formal guidance as well as Pepco's operational philosophy.

Meeting the scale of the District's ambitious goals while balancing the Guiding Principles will require thoughtful planning and program design. As noted in the Climate Solutions Plan, the Commission and District acknowledge that the Guiding Principles can at times be in tension and require careful consideration and tradeoffs to create a balanced approach.[4] Pepco is well-equipped to manage what can be competing priorities, as demonstrated by the Company's long history operating in the District to provide reliable utility service, resource planning, and impactful customer programs. Thus, while Pepco's 15-Year Plans reflects these core principles, programming at times may promote some principles more than others.

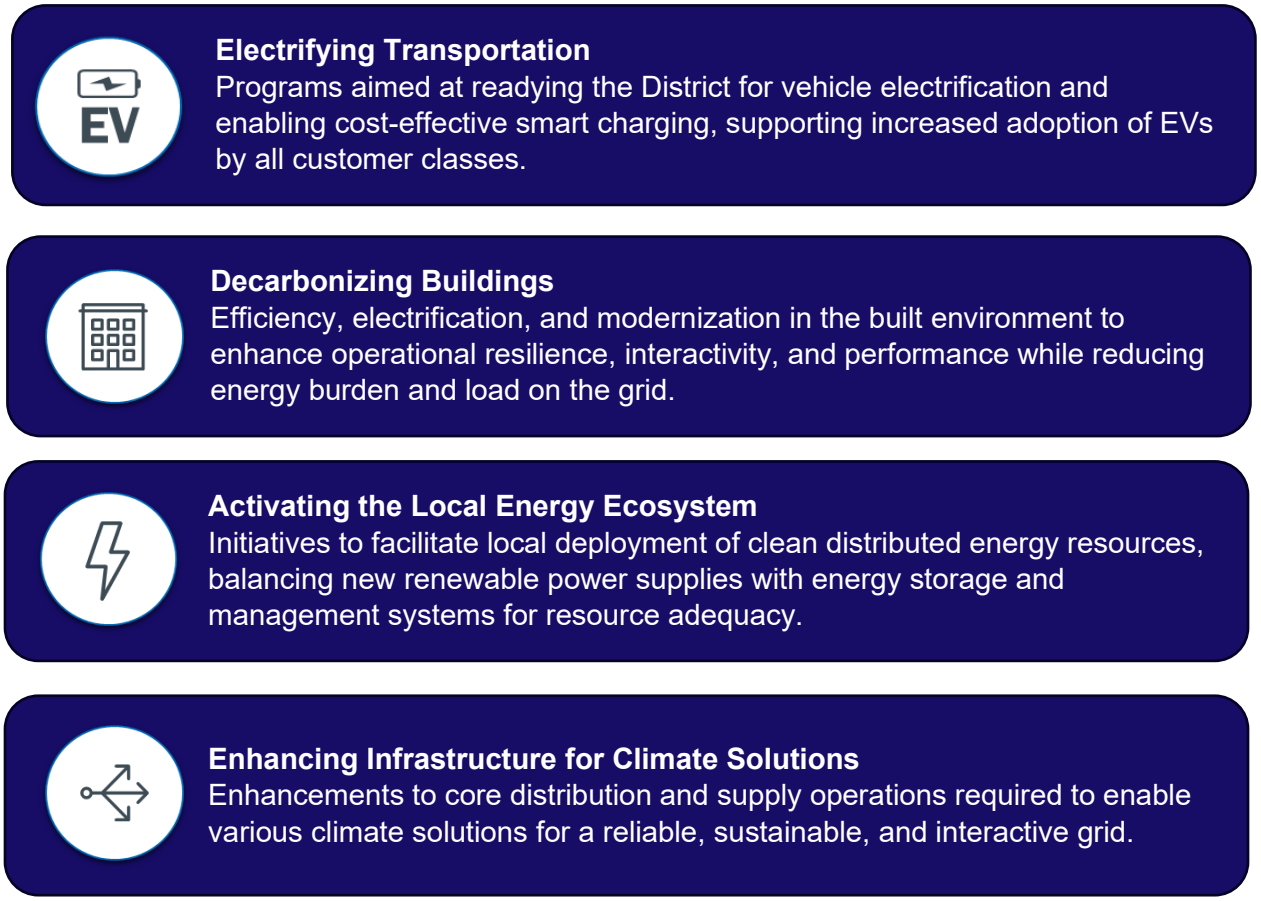
Notably, the Guiding Principles align with the BCA Part B metrics established under Order No. 21928. By applying the Guiding Principles in climate solutions planning, and then using the BCA metrics to guide program design, investment, and evaluation, Pepco can drive alignment between the BCA and its programs to support the District's and Commission's climate vision, and the Company's operational standards, while keeping affordability front and center. This alignment strengthens the connection between policy and program outcomes.



[4] *See, e.g., Clean Energy DC* at 26.

2.2. Climate Solutions Plan Strategic Portfolios

The Climate Solutions Plan establishes Strategic Portfolios of programs across four market segments to advance carbon neutrality in the District:



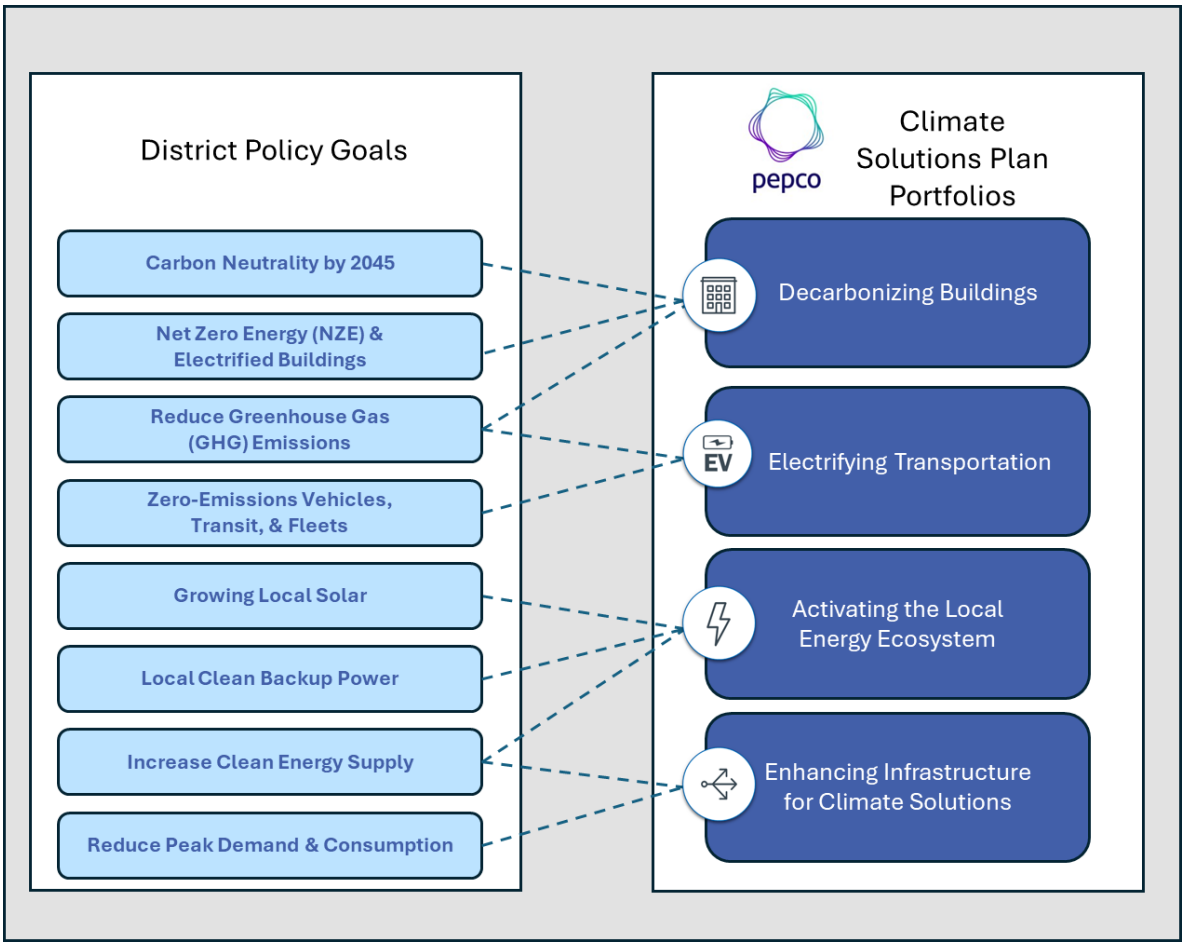
These focus areas build on Pepco's expertise as a transmission and distribution utility, which does not own electric generation assets but is instrumental in enabling distributed energy technologies and widespread emissions reductions. The portfolios' clear market segments enable Pepco to engage with consumer-specific dynamics, including: industry best practices and evolving technologies; anticipated electrification trends modeled in the Electrification Plan; and the infrastructure enhancements necessary to manage the expected load increases and shifts. The Strategic Portfolios and their objectives in the 15-Year Plan are further detailed in Section 4.

2.3. Climate Solutions Plan in the District Policy Environment

In accordance with Formal Case No. 1167, the Climate Solutions Plan was established to provide a consistent framework for the Company to plan, evaluate, and propose decarbonization initiatives in support of near- and long-term District policies. As detailed in Section 1.3, the portfolios defined within the Climate Solutions Plan are each guided by extensive Commission direction and policy. The proposed programs in each portfolio incorporate approved and planned filings and District climate projects where appropriate.

Since the Climate Solutions Plan was filed in July 2021, the District government has adopted legislation to expand and accelerate relevant goals as detailed in Section 1.2. In light of these changes, the Climate Solutions Plan continues to be supportive of District policy. Company strategies outlined in the 15-Year Plan align with both the Company's Climate Solutions Plan framework and current District decarbonization goals.

Pepco's Strategic Portfolios Support District Decarbonization Goals



2.4. Climate Solutions Plan in the District Consumer Market

The District's energy generation, supply, and distribution markets are defined by its governance and regulatory structure. As a transmission and distribution utility that does not generate any of its supply, Pepco is reliant on the wholesale market, supply agreements , and DERs to deliver safe and reliable service to its customers. As of March 2025, 98% of electricity consumed in the District is generated in other states and imported via the PJM market.[5] Emerging trends and recent market dynamics have highlighted the need to prioritize and balance **affordability**, **reliability**, and **equity** in the 5-Year Plan in order to maintain resource adequacy.

[5]. U.S. Energy Information Administration, District of Columbia State Energy Profile

Electricity consumption in both the residential and commercial sectors of the District has remained relatively stable over the past decade. However, spikes in electric demand have been observed at both the national and regional levels in the most recent years due to the rise in electrification, cloud computing, and regional data center hubs. Non-electrification demand is estimated to increase by an average of about 1.7% annually through 2040 according to Pepco's updated Electrification Study (filed concurrently with the 15-Year Plan). If the District achieves its ambitious electrification goals by 2040, the study estimates electric demand would grow even faster, at an average annual rate of about 3.1%.

According to the May 2025 Short-Term Energy Outlook published by the U.S. Energy Information Administration (EIA), electricity consumption is expected to grow nationally at an average rate of 1.7% per year from 2020 through 2026.[6] Regionally, PJM's 2025 Long-Term Load Forecast Report predicts significant growth of 2.0-2.4% in electricity demand over a 20-year planning horizon.[7] These forecasts represent a marked increase compared to PJM's 2024 Long-Term Load Forecast of 1.6-1.8% annualized demand growth.

At the same time, PJM capacity pricing has surged, with the 2025-26 capacity auction yielding an 800-900% price increase compared to previous year's auction.[8] This spike is driven by a confluence of factors including retiring capacity, limited new capacity coming online, market reforms, and increased demand. While policy efforts and regulatory reform are underway to limit similar future increases, capacity pricing in particular remains a primary concern to Pepco in ensuring resource adequacy, especially as electrification drives continued load growth.

Defining DERs

Distributed Energy Resources, or DERs, are small, localized energy generation (e.g., solar) or storage assets. By being sited at the location of energy demand, DERs take strain off of the grid when demand is high, and can avoid expensive distribution system updates. DERs also support resilience by distributing generation assets across Pepco's footprint. Lastly, they offer a way for customers to supply and access more affordable renewable energy, offsetting potentially costly fossil-fuel based power generation.

Consumption trends in commercial and residential markets and their impacts are further analyzed in the Company's Electrification Study update, which is filed with this plan. The 15-Year Plan accounts for these trends alongside external market factors, with select Guiding Principles prioritized in the 5-Year Plan to outline near-term programs that can meet the growing and immediate resource adequacy challenge, especially in the face of shifting District and Federal funding, priorities, and economic policy.

[6] U.S. EIA. (2024, April 25). *U.S. electricity demand grew at its fastest rate in decades in 2022 and 2023*.
[7] McGovern, Jeffery. "2025 Long-Term Load Forecast Report Predicts Significant Increase in Electricity Demand." *PJM Inside Lines*, 30 Jan. 2025
[8] McGovern, Jason. "PJM Capacity Auction Procures Sufficient Resources to Meet RTO Reliability Requirement." *PJM Inside Lines*, 30 July 2024

3. 15-Year Planning Approach

To advance Order 22313 and the Climate Solutions Plan, the 15-Year Plan provides a roadmap of the Company's vision to advance climate goals while keeping affordability front and center and maintaining safe and reliable utility service. Each 5-Year Plan – ranging from 5- to 15-year planning horizons, in five-year increments – outlines Pepco's aims for the respective time period, in consideration of the role of the utility and appropriate Guiding Principles based on current forecasts of regulatory, market, and technology trends (see Section 2). Each Plan maps out the "what" and the "how" of Pepco's actions to achieve its aims within that period.

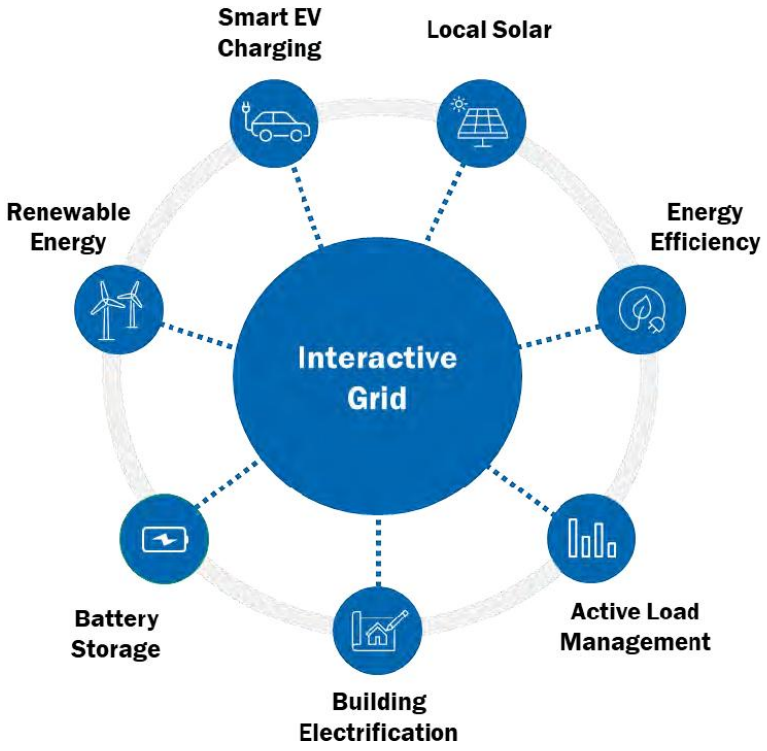
3.1. Pepco's Role

As detailed in following sections, Pepco's plans to support decarbonization in the District are informed by the Company's function, expertise, and Guiding Principles in best addressing barriers and deploying solutions.

Pepco recognizes and embraces its role as a central partner to the District in realizing the vision of carbon neutrality by 2045. As the District's sole electric utility, Pepco's Climate Solutions Plan envisions the Company as the "Connector" between utility resources and grid-edge technologies to enable the energy transition and promote resource adequacy. Through its 15-Year Plan and related filings, the Company will leverage its unique position to enhance core grid operations at-scale and ready the distribution system for electrification, clean energy integration, and interactivity while keeping affordability front and center and maintaining safe and reliable service. In parallel, the Company will deploy tools, resources, and programming informed by utility data and expertise in order to activate developer investment and customer adoption of the technologies and behaviors necessary to meet climate goals.

Realizing Pepco's vision of grid interactivity will require close coordination with a diverse set of stakeholders, including District leadership and policymakers, the Commission, customers across all classes, builders and developers, system operators, contractors and technicians, and more – a broad consortium that is reflective of the variety of grid end-uses which Pepco will connect. Through cross-sector climate solution synergies, Pepco can help realize the District's vision of a robust clean energy economy for its residents, businesses, local workforce, and investors.

Pepco's Climate Solutions Plan Envisions the Utility as the "Connector" Leveraging the Grid as the "Platform" for Grid-Edge Technologies



Source: Pepco Climate Solutions Plan

To meet the District's goals of energy conservation and resiliency – including the CEDC Act's BEPS and subsequent NZE building codes – residential and commercial customers may need to deeply retrofit homes and businesses, which Pepco can advance through programs that offer performance incentives for reduced demand, audits and technical resources.. Pepco can also help facilitate the electrification of buildings and transportation by reducing economic barriers to make-ready rebates and enabling rate structures that mitigate impact to utility bills.

Activating capital is increasingly important to modernizing and decarbonizing local energy systems while managing affordability, especially as District budgets and Federal funding priorities may evolve. Pepco can accelerate deployment of customer- and third party-owned energy assets across all wards by providing data to optimally and equitably site projects and by streamlining interconnection. Company programs that promote project economics and enable monetization of grid-edge technologies are critical to customer and third-party investment decisions. In parallel, Pepco has the unique ability to finance various initiatives over the long duration of a program or asset, making solutions more affordable and accessible to customers.

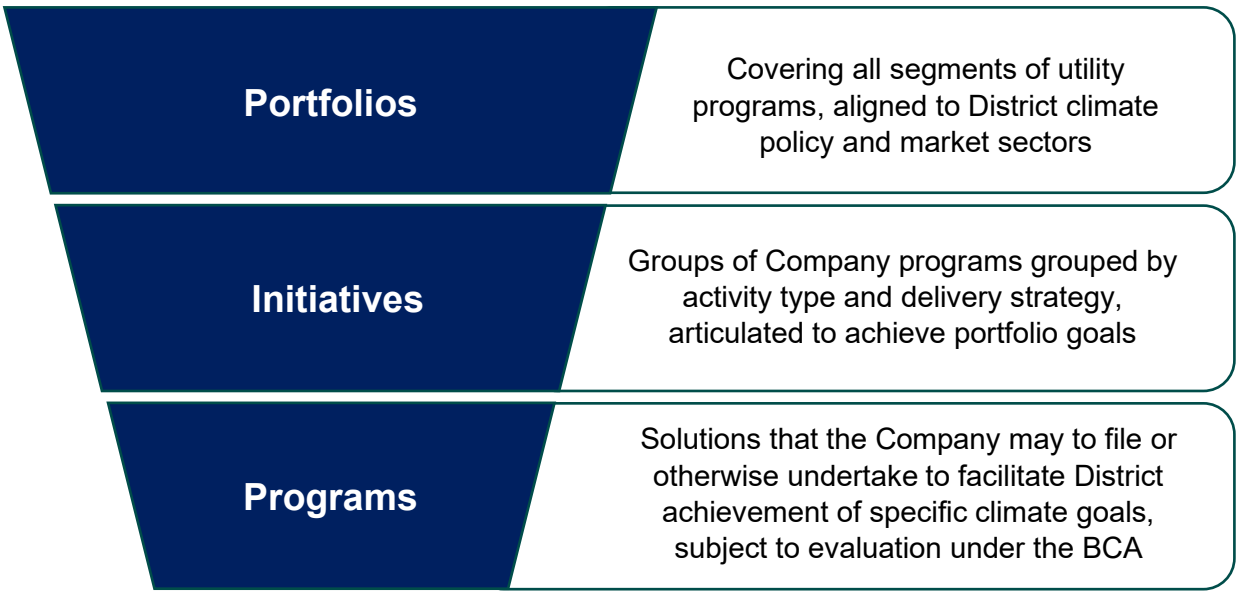
As the singular owner-operator of the District's electrical distribution system, Pepco is exclusively able to implement and operate grid service enhancements necessary to

enable grid modernization, electrification, and integration of clean energy across the District.

3.2. Plan Organization

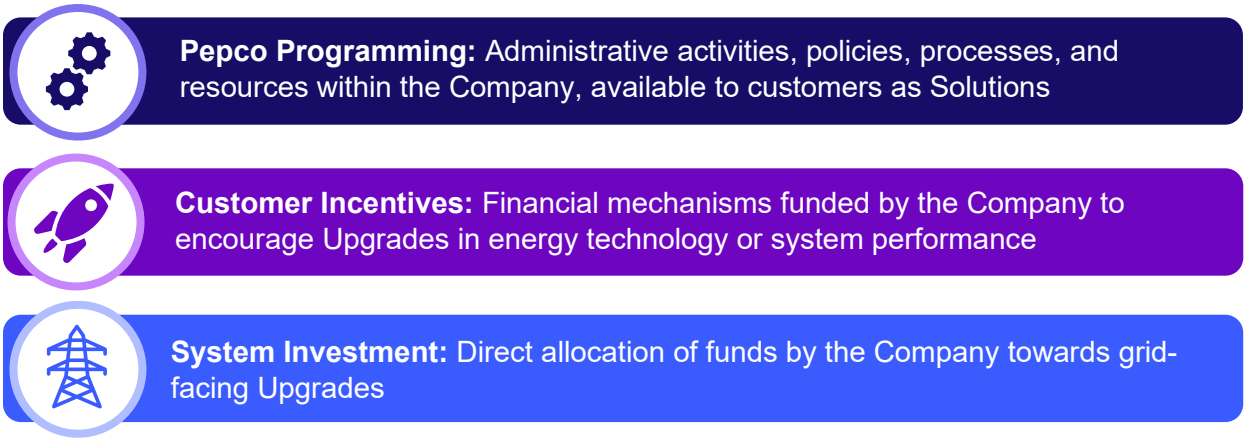
Pepco's plans are structured in 5-year increments and across the Company's four Strategic Portfolios, respectively. This portfolio-based structure enables the development of well-defined roadmaps of Pepco actions which build upon each other across the full horizon of the 15-Year Plan. Each Plan groups Pepco's activities, or *programs*, by *initiatives* within *portfolios*.

Organization of Planning Periods in 15-Year Plan



Each *initiative* can include several *programs* aligned by activity type and delivery strategy to advance a particular objective in the planning period. Initiatives may include **Solutions**, which seek to influence behavior and system usage, or **Upgrades**, which aim to deploy infrastructure.

Delivery strategies include **Pepco Programming**, **Customer Incentives**, and **System Investment**, which demonstrate the primary flow of resources provided by a program to affect its objective.



3.3. Stakeholder Engagement

Throughout Formal Case No. 1167, Pepco has maintained a proactive and transparent approach to stakeholder engagement. This has included one-on-one meetings with stakeholders and participation in active working groups such as the FC1183 Resource Adequacy Working Group. While developing its updated 15-Year Plan, Pepco actively sought input from stakeholders and incorporated their feedback into program design. This included a series of virtual engagement sessions to review proposed programs and integrate feedback where appropriate, including sessions with:

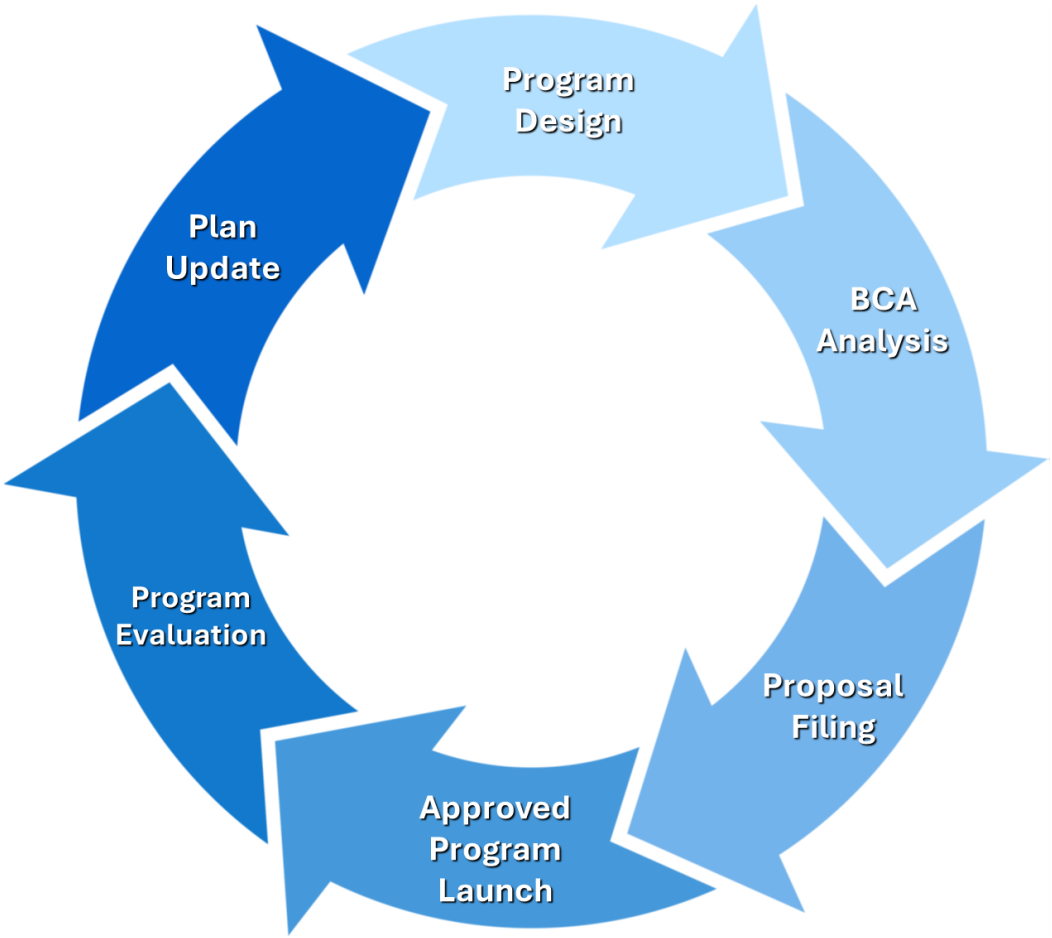
- Solar Energy Industry Association – June 9, 2025
- Office of the People's Counsel – June 9, 2025; October 16, 2025
- District Department of Energy and Environment – June 10, 2025; October 3, 2025
- Chesapeake Solar and Storage Association – June 10, 2025, October 24, 2025
- Earthjustice & Sierra Club – June 10, 2025; September 30, 2025
- Apartment and Office Building Association of Metropolitan Washington – June 11, 2025; October 7, 2025
- Washington Metropolitan Area Transit Authority – June 12, 2025; October 2, 2025
- Grid 2.0 – June 12, 2025; September 30, 2025
- DC Sustainable Energy Utility (DCSEU) – August 7, 2025; October 1, 2025

3.4. Approach to Execution

Formal Case No. 1167 provides a path for Pepco to propose programs that advance the District's energy and decarbonization goals. It also outlines a process for the Commission to provide regulatory certainty once formal program applications are filed. In accordance with this direction, the Company intends that programs identified in each 5-Year Plan "roadmap" under the 15-Year Plan would ultimately progress through a proposed Action Plan, from planning to implementation. The 15-Year Plan's execution is influenced by

Commission decisions as well input received from intervenors and stakeholders. As stakeholder feedback and performance data is incorporated, program design will be refined to improve cost-effectiveness and impact as evaluated under the BCA.

Action Plan to Advance 15-Year Plan Programming



In accordance with Order 22313, the Company will provide an informational report every three years, which will update the status of the 15-Year Plan and explain proposed revisions, if any. Revisions may address programs proposed to be accelerated or delayed in their implementation, in consideration of market, customer, and technology trends as well as progress towards District targets. These reports are anticipated to provide updates on the status of the action plans and milestones, including relevant data, feedback, and observations which may impact programs and roadmaps for the subsequent planning horizon(s). Reports will summarize BCA outputs for relevant programs implemented during the reporting period, including modeled GHG emissions and other metrics. As such, the Company will report against progress towards District climate milestones using the methodologies established under the BCA.

3.5. Approach to Cost Recovery

The programs in the 15-Year Plan can only be implemented through allocation of Company resources and strategic utility investment. These outlays must be recovered in a comprehensive and timely manner through mechanisms such as rate cases, regulatory asset treatment, or surcharges and riders. In addition to the above Action Plan, in Formal Case No. 1167 the Commission can approve cost-recovery mechanisms required to implement approved programs, after receiving comment from interested parties. Formal Case No. 1155 and Formal Case No. 1160 provide precedent for Commission approval of various cost recovery strategies for programs aimed at advancing decarbonization in the District,

When Pepco applies for specific approval to implement programs as outlined in Section 3.4, the Company will also propose for approval the cost recovery mechanism it recommends as most appropriate for each program. This approach allows for filings to consider customer affordability and provide certainty in customer utility bill impacts from approved programs. Potential cost recovery strategies may be recommended in consideration of program design and associated factors as applicable such as: target market segment; eligibility and expected beneficiaries; participation structure (i.e., voluntary, mandatory, or event-based); anticipated program or asset life; degree and certainty of impact on energy sales; customer value; etc. As a standard practice, cost recovery recommendations will seek to promote equity and mitigate cross-subsidization.

4. Climate Solutions Portfolios in 15-Year Plan

The following sections provide a brief overview of each portfolio, including its overarching strategy and alignment with the District's decarbonization policies, Pepco's Climate Solutions Plan, and the Company's Guiding Principles. As outlined in the Climate Solutions Plan, these portfolios are intended to work together and complement each other, leveraging the Pepco grid as a connected platform to enable carbon neutrality by 2045.

4.1. Electrifying Transportation

The **Electrifying Transportation** portfolio is comprised of programs aimed at readying the District for vehicle electrification and enabling smart charging to manage grid impacts and energy burden, supporting increased adoption of EVs by all customer classes and third-party investment in accessible electrified transit infrastructure.

Advancing District Policy

Since the development of the Climate Solutions Plan in 2021, the District has set new vehicle electrification-related goals to help achieve carbon neutrality by 2045, specifically adopting the ACC2 regulations in 2023. These new regulations aim to reduce the 21% of the District's GHG emissions that come from the transportation sector by requiring an increasing percentage of new vehicle sales to be ZEVs, culminating in 100% ZEV sales by 2035. The District's guiding legislation for transportation electrification, including ACC2, establishes interim targets as early as 2030, within the horizon of the 5-Year Plan period. The Company's 15-Year Plan identifies solutions to facilitate the District's achievement of both near-term milestones and the long-term full ZEV adoption.

Electrifying Transportation Portfolio & District Milestones

Achieving the District's transportation electrification targets will not be possible without Pepco's support in delivering power and connecting to the thousands of new charging stations needed to accommodate the growing number of EVs. As of 2023, EVs comprise just 2.6% of all vehicles in the District, highlighting the scale of transformation still

required.[9] Likewise, EV adoption by customers will require favorable charging economics, enabled through smart rate design and pay-for-performance programs. Such programs are initially enabled by Formal Case No. 1130 and Formal Case No. 1155, under which Pepco filed and launched its EV Phase 1 program portfolio in 2020. Pepco's EV Phase 2 programs are anticipated to be filed within the 5-Year Plan period.

Delivering Pepco's Vision for the Grid

To help advance District goals, the **Electrifying Transportation** portfolio includes **Rate Solutions** and **EV Make-Ready Upgrades** initiatives to promote smart EV charging and related infrastructure while limiting demand increases through off-peak fueling and future vehicle-to-grid (V2G) and vehicle-to-everything (V2X) activities.

EV Make-Ready Upgrades
Make-ready upgrades for EV charging refer to the electrical improvements needed to support the installation of vehicle charging stations. These upgrades often provide increased service capacity and include infrastructure such as transformer replacements, and meter or electrical panel expansions. Upgrades include infrastructure on the Pepco side of the system – up to but not including the new charger.

These efforts build on the foundation established in EV Phase 1 of Pepco's Transportation Electrification program (filed under Formal Case No. 1130 and 1155) and draw on the successes of EV programs implemented by Pepco in other jurisdictions. Together, they aim to address major infrastructural and financial barriers to EV adoption in accordance with Pepco's Guiding Principles. The solutions are also designed to grow visibility of EV capabilities within the District to counter perceived barriers and encourage adoption.

In particular, this portfolio seeks to expand access of low- to moderate-income (LMI) customers to electrified transportation options and their benefits.[10] LMI customers may face barriers to EV usage stemming from lower rates of private vehicle ownership, reliance on public or alternative transit, and limited residential charging access. Pepco's cross-market programs encourage investment by fleet and charger operators, public transit, and third parties to expand accessible EV services.

In the near-term, programming balances accelerating electrification across all Wards with effective load management to maintain resource adequacy and limit the impact on customer energy burden. Over time, smart charging infrastructure can be increasingly leveraged for advanced applications to support a more interactive, flexible grid.

[9] U.S. DOE Alternative Fuels Data Center

[10] Low- to moderate-income typically considered to be residential customers earning up to 200% or up to 400% of the Federal Poverty Line, respectively, in consideration of household size and geographic location. Additional income bands may be considered on a program-by-program basis.

Guiding Principles for Electrifying Transportation Portfolio

Interactivity: Incentivize smart EV charger deployment to empower customer load management, enhance grid visibility, and enable bi-directional charging to support the grid and other loads

Equity & Inclusivity: Facilitate an equitable distribution of charging infrastructure by right-sizing incentives to attract third-party investment in accessible sites & enabling electrified transit options

Affordability: Develop rate designs that can improve the economics of bi-directional EV charging for operators and drivers, and programs for active and passive customer bill management

Reliability: Manage peak load growth by encouraging off-peak charging, demand response, and V2G, leveraging integrated vehicle batteries, smart technologies, and rates

Sustainability: Accelerate EV adoption across segments to significantly reduce carbon emissions, improve local air quality, and integrate renewables

Enabling Greenhouse Gas Reductions

Transportation electrification will reduce a major contributor to GHG in the District by eliminating tailpipe and Scope 1 emissions from vehicles and fleets. EV deployment will increase power supplied to customers by Pepco and likewise the Company's Scope 3 emissions in the near-term. As the RPS increases through 2032, the Scope 2 emissions of District EV users and the Company's Scope 3 emissions will decrease. Mechanisms which reduce peak demand on the grid – including Company programs likes TOU rates and Managed Charging, and later V2G – serve to further reduce carbon intensity of grid power for EV transportation and associated emissions by limiting reliance on high-intensity peaker plants. GHG impacts of proposed programs will be evaluated in accordance with the established BCA methodology.

Defining GHG Emissions

The Greenhouse Gas Protocol categorizes emissions: **Scope 1** includes direct emissions from owned or controlled sources (e.g., vehicles, on-site fuel combustion); **Scope 2** covers indirect emissions associated with purchased electricity, steam, heating, and cooling; and **Scope 3** includes all other indirect emissions across the value chain, such as those from suppliers, product use, business travel, and waste. As a transmission and distribution utility, the majority of Pepco's emissions are Scope 3 associated with procurement and sale of power.

4.2. Decarbonizing Buildings

The **Decarbonizing Buildings** portfolio promotes building efficiency, electrification, and modernization to enhance operational resilience, interactivity, and performance while managing customer energy burden and load on the grid.

Advancing District Policy

Buildings are the largest source of GHG emissions in the District, accounting for 72%.[11] As the District's sole electricity utility, Pepco is uniquely positioned to help the District meet its climate goals by supporting energy efficiency, reducing total and peak loads, facilitating the adoption of NZE buildings standards, and accelerating electrification – ultimately reducing emissions and demand from the built environment. In recent years, major policy updates and new legislation have reshaped the District's building decarbonization targets, requiring increased electrification.

[11] DOEE Greenhouse Gas Inventories

Decarbonizing Buildings Portfolio & District Milestones

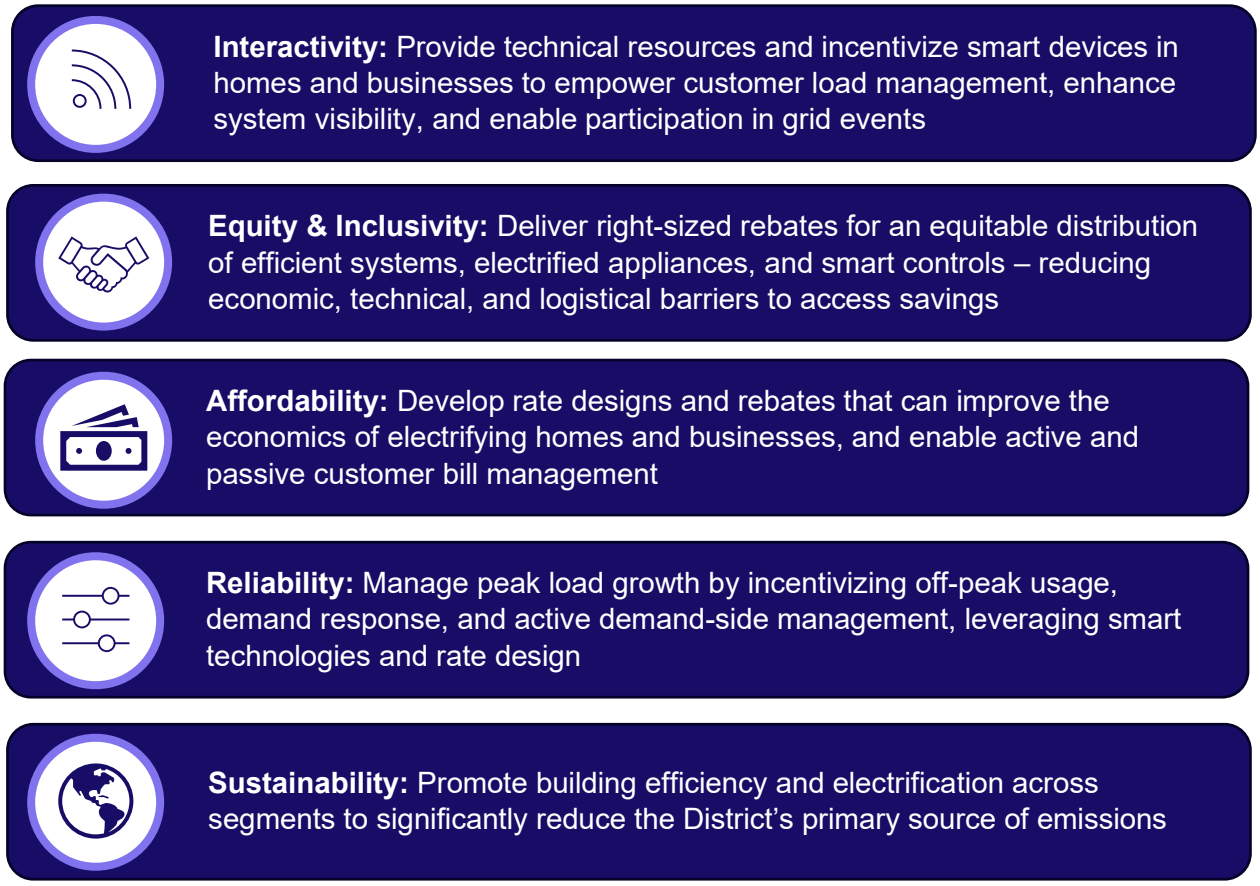
To support this transition, Pepco has developed a comprehensive portfolio of demand-side management programs focused on reducing energy use and make-ready infrastructure to accelerate electrification. The programs are enabled by Formal Case Nos. 1148, 1160, and 1130 regarding rate design, DR, and customer energy management. In the 5-Year Plan, programs are intended to complement available incentives provided via DOEE and other District stakeholders.

Delivering Pepco's Vision for the Grid

Efficiency and demand-side management strategies yield compounding benefits by reducing the total loads which must be powered via renewable energy to achieve energy transition and maintain resource adequacy. Pepco's solutions prioritize near-term base and peak load reductions by expanding access to efficient appliances and smart devices through rebate incentives for **Building Upgrades** and encouraging cost-effective energy use for customers through **Rate Solutions** and **Behavioral & Technical Solutions**. These solutions enable reduced energy burden for customers and grid reliability through resource adequacy. As the RPS grows over time, Pepco's programmatic focus will increasingly promote building electrification – providing infrastructure, rates, and other resources to best leverage new connected systems while managing load growth and customer bill impacts.

This portfolio seeks to capitalize on the demonstrated success of similar Exelon family offerings, including Pepco Maryland and rigorous program design completed to prepare Pepco DC's EEDR proposal under Formal Case No. 1160. Customer engagement in this portfolio begins early on, with education and technical assistance to help participants reduce energy costs. Customers will subsequently be directed toward complementary implementation-focused programs in the portfolio, such as rebates for advanced appliances, make-ready service upgrades, and LMI-specific programming intended to readily reduce energy consumption and bills. In offering tailored support throughout the customer's energy journey, Pepco can build trusted relationships starting at home and in the workplace to help customers participate in the energy transition.

Guiding Principles for Decarbonizing Buildings Portfolio



Enabling Greenhouse Gas Reductions

Building decarbonization will address the District's largest source of emissions, 69% of which come from commercial buildings and 31% from residential.[12] More efficient homes and businesses will enable a reduction in Pepco's Scope 3 emissions, as less energy is delivered to customers. Meanwhile, as with transportation, building electrification will result in a near-term increase in Scope 3 emissions as Pepco serves greater building end-uses. This uptick is expected to be mitigated by efficiency measures in the near-term and a growing renewables mix through 2032. A similar trend in customer emissions can be expected as with EV conversion: building electrification will provide a reduction in Scope 1 emissions associated with onsite heating and cooking fuel, while enhanced appliance efficiency enables reduced Scope 2 emissions through reductions in purchased energy. GHG impacts of proposed programs will be modeled under the established BCA methodology.

EEDR Potential Study Supports Efficiency Efforts for Long-Term Decarbonization

Pepco's 2022 EEDR Potential Study filed under Formal Case No. 1160 found that the District has substantial remaining potential to reduce energy consumption through efficiency measures. The study estimates that by 2032, the District could achieve up to 14.9% cumulative energy savings under a scenario with high customer incentives. The programs proposed under this initiative accelerate energy efficiency over the 5-Year Plan period while introducing early-stage electrification measures, setting the stage for a broader shift to full electrification over the 10- and 15-Year Plan horizons.

Energy efficiency directly supports energy transition and resource adequacy by reducing the total amount of electricity the system must supply and deliver, especially during peak demand periods. By reducing demand at critical times, efficiency measures help ensure that available generation resources are sufficient to meet customer needs without overburdening the grid. Efficiency also helps to accelerate progress towards RPS targets, as the load that must be met by renewable generation is reduced. For developers and customers considering DERs, implementing energy efficiency upgrades as a first step can allow them to downsize onsite solar and achieve more favorable project economics, ultimately promoting deployment.

In this way, programs that accelerate adoption of energy-saving technologies – such as efficient heating, ventilation, and air conditioning (HVAC) systems, appliances, and building envelope improvements – not only reduce individual customer energy burden and building occupant comfort but also enhance the resilience and sustainability of the entire distribution system. The scale of efficiency improvements and compounding benefits in electrification and RPS goals as demonstrated by the Potential Study underscore the cost-effectiveness of efficiency programs.

[12] DOEE Greenhouse Gas Inventories

4.3. Activating the Local Energy Ecosystem

Where the first two portfolios serve to reduce the District's GHG emissions through electrification and efficiency of end-uses, the **Activating the Local Energy Ecosystem** portfolio expands deployment of DERs within the District to enable end-uses to be met by renewable sources. The portfolio is comprised of customer-facing solutions to balance growing dynamic clean power supplies with distributed energy storage and management systems to maintain resource adequacy across the Pepco system.

Advancing District Policy

The CEDC Act requires that 100% of the District's energy supply come from Tier 1 renewable sources by 2032[13], with increasing interim goals through the target date and a carve-out for local solar of 15%[14]. The carve-out must be met either by solar generation located within the District or interconnected through a feeder that directly serves the District. These mandates highlight the need to accelerate adoption of renewables and DERs while maintaining reliability of service and keeping affordability front and center.

Activating the Local Energy Ecosystem Portfolio & District Milestones

** ACCELERATED VS. 2021 CLIMATE SOLUTIONS PLAN*

Pepco's current interconnection and net metering frameworks are established through Formal Case No. 1050, while renewable purchases are regulated under Formal Case No. 1017, Storage and DER under Formal Case No. 1166, and microgrids under Formal Case No. 1163. The PowerPath DC docket under Formal Case No. 1130 establishes significant guidance on the topic of grid modernization – including renewable energy integration and customer energy management.

Delivering Pepco's Vision for the Grid

This portfolio considers Pepco's unique role as the utility to provide decision-making data, provide expanded access to renewable supply options, and directly activate DER projects to provide clean, resilient service where most needed, including LMI communities.

[13] Per the Commission, "Tier 1" renewable resources include solar, wind, biomass (greater than 65% efficiency), landfill gas, waste-water treatment gas, geothermal, ocean (mechanical and thermal), fuel cells fueled by "Tier 1" resources, and wastewater used as a heat source as a sink for heating or cooling systems.

[14] As codified by the more recent Local Solar Expansion Amendment Act of 2022.

Integrating dynamic local energy supplies while maintaining grid reliability will require data-driven resources for developers and incentives that enable the DER use case. The **Interconnection Solutions** initiatives in this portfolio enhance existing processes to facilitate DER deployment for developers and customers. In the near-term, Pepco will provide technical support to reduce installation barriers, such as helping developers identify non-restricted feeders with available capacity, offering engineering consultation for complex interconnections, and guiding projects through the approval process.

The intermittent nature of renewable generation can be in tension with resource adequacy. **DER Upgrades** intend to complement local generation by offering incentives first to expand installed distributed energy storage and then to leverage these systems to dispatch energy and provide other services to the grid. Incentives accelerate DER deployment through improved affordability and economics, while cost-effectively sharing their reliability benefits across District communities.

As technology matures, smart device data enables clear insights, and the value of grid services is more defined, Pepco's programs will look to provide customers additional avenues to monetize DER assets and support the distribution system – more fully realizing the vision of a connected and sustainable grid.

Guiding Principles for Activating the Local Energy Ecosystem Portfolio

Enabling Greenhouse Gas Reductions

Expanding local renewable energy generation in the District is at the crux of the energy transition to achieve carbon neutrality. Deployment of local DERs will enable Pepco to slash its Scope 3 emissions by reducing the amount of grid power which must be supplied by the Company from generators. Similarly, customers deploying DER in the District will reduce their Scope 2 emissions by replacing grid electricity purchased for end uses with low-carbon renewable power. Impact of proposed programs on GHG emissions will be quantified in accordance with the BCA methodology once established.

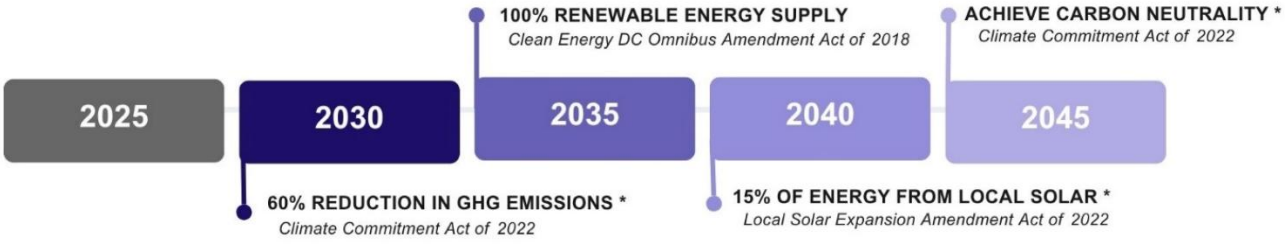
4.4. Enhancing Infrastructure for Climate Solutions

This portfolio outlines Company-focused efforts to enhance core utility distribution and supply operations as required to enable various climate solutions for a reliable, sustainable, and interactive grid.

Advancing District Policy

By connecting an increasingly flexible and renewable distribution system across a growing number grid-edge smart technologies, the Company can help realize the District's broadest energy and decarbonization targets while delivering reliable, resilient service.

Enhancing Infrastructure for Climate Solutions Portfolio & District Milestones



** ACCELERATED VS. 2021 CLIMATE SOLUTIONS PLAN*

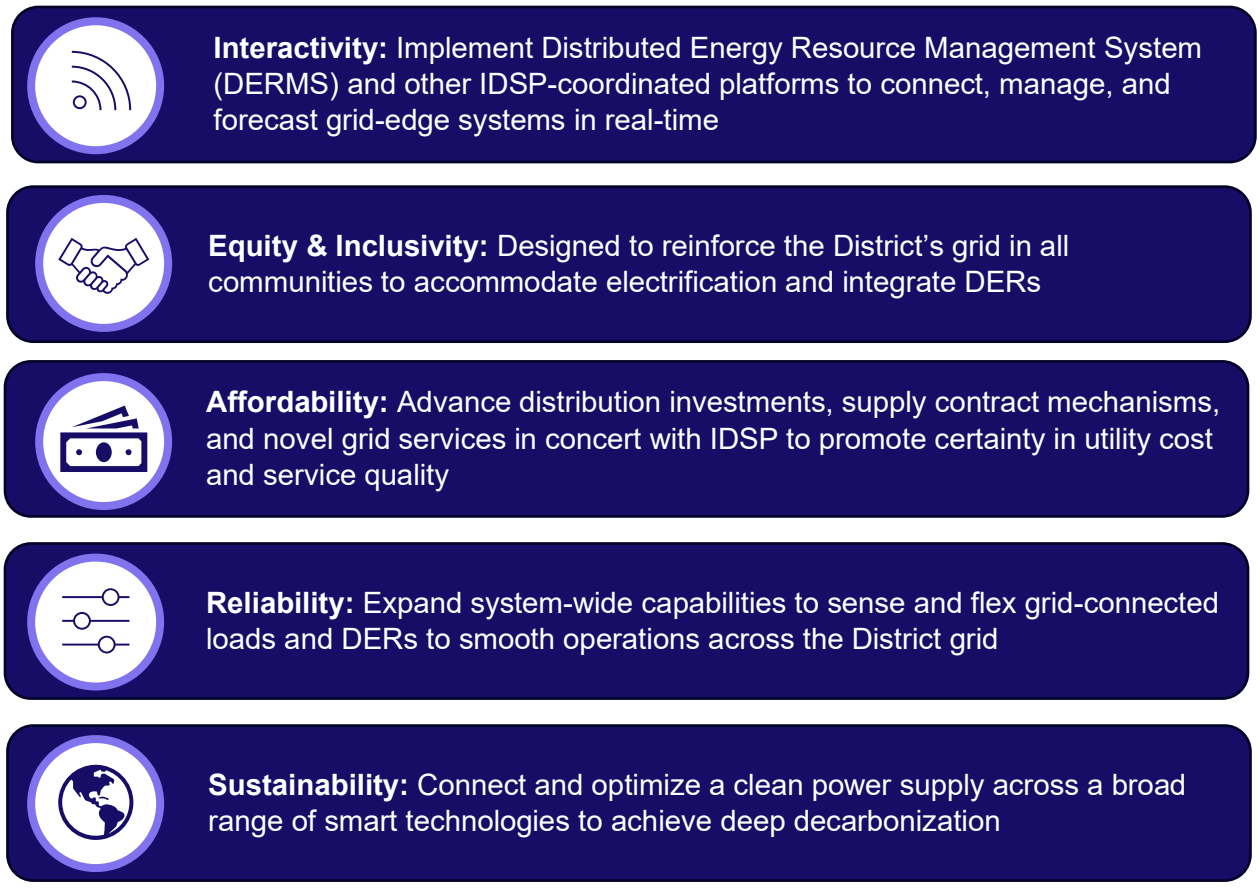
Reflective of the central role that the distribution grid plays in the District's decarbonization efforts, this portfolio is influenced by a number of the dockets and climate projects identified in Section 1.3. In recognition of the interconnectivity and complexity of such matters, Formal Case No. 1182 considers the IDSP process. The IDSP is intended to provide a holistic perspective of anticipated utility needs, priorities, and spending outside of the rate case process, and to allow such parties to properly evaluate significant and necessary investments to Pepco's distribution system. Pepco supports the Commission's emphasized need for increased transparency into the utility distribution planning process and the value created to customers, stakeholders, and the Commission by such transparency. While the formal IDSP remains under development in coordination with the Commission and stakeholders, the 15-Year Plan is intended to capture and align with major initiatives documented under a future IDSP.

Delivering Pepco's Vision for the Grid

While the prior portfolios are critical to meet District decarbonization goals through clean energy and electrification, they place increasing pressure on the grid to maintain quality service and resource adequacy. Pepco's existing distribution infrastructure will require modernization, expansion, and enhanced capabilities as the connected supply and load evolves. This portfolio focuses on grid infrastructure efforts across Pepco's distribution system to connect the preceding portfolios.

As the owner of the electric distribution assets in the District, Pepco's interactive grid modernization plan is essential to facilitating the interconnection and operation of DERs, electrified transportation and buildings, and new grid-edge technologies. With a growing number of controllable devices, two-way power flows, and dynamic loads, there are new challenges to maintaining the safety and reliability of the system and new opportunities to optimize the use of the system.

Guiding Principles for Enhancing Infrastructure for Climate Solutions Portfolio



Pepco's **Power Service Solutions** and **Infrastructure Upgrades** proposed in this portfolio will:

- build a stronger and smarter grid to promote resource adequacy;

- leverage real-time data to inform both grid operations and future program design;
- allow for advanced customer and utility control to balance the system; and,
- better integrate carbon-reducing technologies, both distributed and at-scale.

These enhancements will allow customers to unlock the full value associated with smarter electrified devices under an interactive grid. As with any of Pepco's capital improvement, infrastructure, and supply contracting efforts, affordability and equity remain a top priority in advancing reliability of service as the system grows increasingly interactive and sustainable.

Enabling Greenhouse Gas Reductions

The programs under this portfolio are central to the development of the connected grid that accelerates emissions reductions achieved through other portfolios. Increasing the renewables mix provided by Pepco's SOS will reduce Scope 3 and Scope 2 emissions for Pepco and its customers, respectively, as the power supply because increasingly less reliant on carbon-intensive conventional generation sources. **Infrastructure Upgrades** advanced through this portfolio may support or indirectly garner additional emissions reductions. Impact of proposed programs on GHG emissions will be quantified in accordance with the BCA methodology once established.

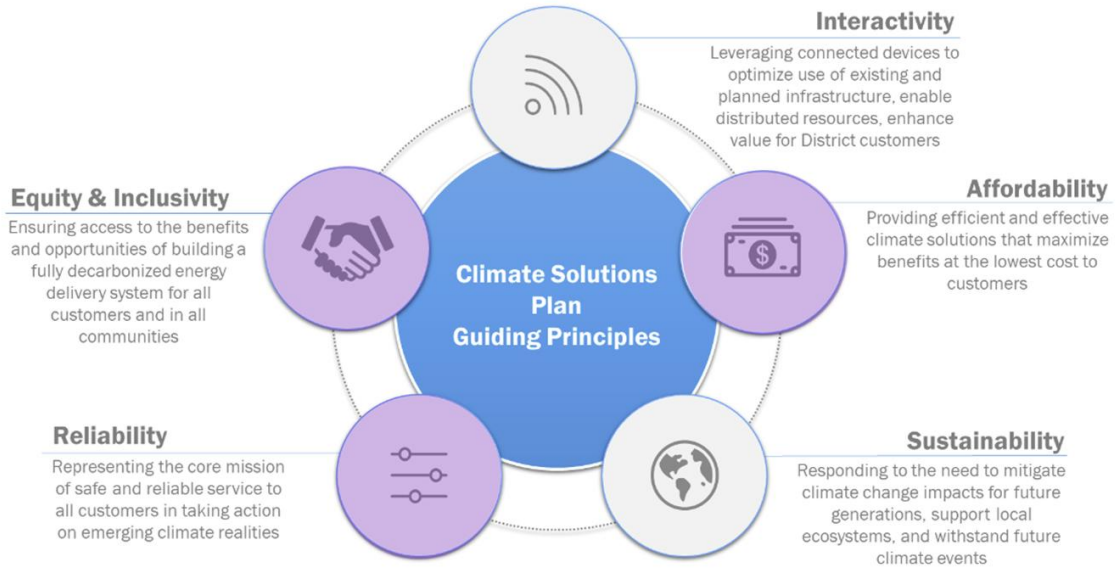
5. Climate Solutions 5-Year Plan

Pepco's 5-Year Plan prioritizes climate solutions to be initiated through 2030. These programs are identified to drive decarbonization towards near-term District goals, provide the foundation for future initiatives and longer-term policy targets, and enhance Company services to meet Commission directives, current customer needs, and market priorities.

In the 5-Year Plan period, Pepco proposes electrification make-ready upgrades, building performance enhancements, and DER integration while implementing enabling grid enhancements and expanding Company resources available to customers and developers. The 5-Year Plan incorporates commercially available technologies, planned or "in-flight" Company activities, and proven peer utility strategies to identify programs that are presently actionable. As such, the 5-Year Plan outlines a realistic strategy to address both the most immediate challenges to safe, reliable service, as well as gaps on the critical path towards Pepco's long-term vision of the connected grid.

As detailed in Section 2.4, building and maintaining resource adequacy has emerged as a critical focus for Pepco in achieving safe and robust power distribution service. This urgency comes in response to recent but sustained surges in demand growth and capacity pricing, and is underscored by evolving District budgets and increasing severe weather impacts. Pepco's ability to deliver **reliable**, **affordable**, and **equitable** service is fundamental to its function and to the District's energy goals. Neither an interactive nor sustainable grid is achievable without strong core operations. With this context, the 5-Year Plan emphasizes select Guiding Principles in proposing initiatives and programs which can immediately contribute to cost-effective and inclusive resilience, and place Pepco firmly on the road to long-term resource adequacy. These Guiding Principles – Equity, Affordability, and Reliability – are well aligned with current District, Commission, and Federal priorities, respectively.

Pepco's 5-Year Plan Emphasizes Select Guiding Principles, shown in purple



5.1. Electrifying Transportation
5-Year Plan

In the 5-Year Plan, Pepco plans to continue to build on programs identified and deployed under the Formal Case No. 1155 EV Phase 1 Transportation Electrification program. The programs detailed here incorporate lessons learned from previous filings and their implementation. The Plan also considers the changes in EV policies nationwide and in the District (e.g., ACC2) and the impact this will have on immediate adoption and penetration in the District. In the 5-Year Plan period, Pepco is focused on building the foundation for EV charging in the District through planning and siting initiatives, rate design, incentives, and program maturation and standup. Programs in this portfolio advance transportation electrification by reducing upfront and operating costs for EV owners. These programs improve the economics of charging services to encourage uptake of EVs and charging infrastructure by early adopters, when technology costs remain relatively high, to progress towards District clean vehicle targets and slash transportation emissions. Commercial and public chargers promote equitable impact through deployment of shared smart charging resources, accessible by all customer classes in high-utilization areas. Meanwhile, residential programs deliver targeted incentives and load management opportunities to early adopters within their communities.

Pepco's near-term programs fall into two initiatives:

- **EV Rate Solutions**: Establish a clear utility rate policy to support a favorable investment environment and affordability, while incentivizing off-peak charging to enable resource adequacy.
- **EV Make-Ready Upgrades:** Enhance service capacity for charging by addressing technical, infrastructural, and economic barriers-to-entry across all customer and vehicle classes. Incentivize smart charger capabilities to facilitate effective grid operations management and future program design.

The 5-Year Plan prioritizes programs that are expected to have the broadest impact and advance near-term District goals and establish a strong foundation in partnership with early adopters. Through these successes, Pepco will garner valuable performance data – related to EV infrastructure, distribution system impacts, and program design – to better address hard-to-electrify markets while maintaining grid operations in future planning periods.

EV Rate Solutions
Pepco Programming

Rates are a foundational step to shape and incentivize transportation electrification by offering solutions that enable customers to manage their energy use and grid-wide load increases. Pepco proposes a suite of rate design activities that encompass a diverse set of customers and transit types and are responsive to the opportunities and challenges of connecting to a smarter, more flexible grid. Through collaborations with target markets, these rate design initiatives will address a wide variety of class-specific pain points to reduce the overall cost of alternative fueling. Rate design also addresses grid-wide considerations by encouraging off-peak charging. In all, prioritization of rate solution development in the near-term enhances affordability for drivers in the District and maximizes the benefits that all customers experience from integrating this new load onto the grid.

5.1.1. Managed Charging

In order to balance the benefits of transportation electrification with customer energy burden and increased grid demand, Pepco has identified both passive and active demand management strategies for EV charging. EV owners are able to opt-in to one of several TOU rates for vehicle charging as a form of passive management (see Section 5.1.2). For an active load management solution, Pepco will propose a **Managed Charging** program. This solution is a multi-pronged approach for privately owned chargers, using several financial incentives to encourage charging outside of peak periods and mitigate utility charges associated with electrification:

- **Enrollment:** One-time bill credit for customers enrolling their registered EV to Pepco's online **Managed Charging** platform via eligible networked "smart" EV charger or onboard vehicle connection
- **Ongoing Participation:** Monthly bill credit for participating customers who complete a majority of their charging needs during off-peak periods
- **Demand Response:** Supplemental annual bill credit paid for participation in a certain number of Demand Response events per season, with customers pausing EV charging during peak events

Pepco will leverage billing data provided by participants to better understand charging behaviors and refine **Managed Charging** programs in the 10- and 15-Year Plans.

Managed Charging	
Portfolio & Initiative	Electrifying Transportation – Rate Solutions
Program Summary	• Participation-based incentive to encourage participants to reduce EV charging demands during peak period(s), targeting at least 80% off-peak charging
Target Market & Stakeholders	• Residential customers that own an EV and a Smart Charger or on-board vehicle telematics capabilities, including those in multi-unit dwellings • Commercial customers with separately metered Smart Chargers, primarily fleet customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1130 Demand Response • Pepco DC EV Phase 2 filing • Pepco MD EV Phase II Smart Charge Management
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2030: 68% of vehicle registrations are ZEV (ACC2) • 2030: 50% of public buses and fleets are ZEV (CEDC) • 2035: 100% of vehicle registrations are ZEV (ACC2)
Customer Value	• **Affordability:** Deliver customer compensation • **Reliability**: Manage peak load • **Interactivity**: Integrate smart devices and data
Cost Recovery	• Rider
Related Programs	• Key Corridors Charging • Fleet & Taxi Charging • Transit Bus Charging • Residential Charging

5.1.2. Residential EV TOU Rate

Pepco proposes a residential EV charging TOU tariff available to EV owners with either a Smart Level 2 charging station at their home or onboard vehicle telematics. The tariff structure would offer lower rates for overnight and off-peak charging to encourage refueling outside of high-usage periods. In comparison to the currently approved whole house TOU rate for customers with plug-in vehicles (Residential Plug-In Vehicle rate, or R-PIV), this opt-in tariff would apply only to service related to EV charging. As such, smart charger or networked EV capabilities would be required to provide Pepco the necessary charging data for billing, for which Pepco would require a waiver to use vehicle telematics to operate the program. Usage data would be used in future rate design iterations and to improve load forecasting and understanding of customer behaviors.

The **Residential EV TOU Rate** would offer residential customers access to energy cost savings that improve the economics of EV ownership, while reducing burden to the customer in order to participate. By applying TOU rates only to charging activities, the program would be more accessible to customers because it does not require whole-home

behavioral shifts in order to realize the benefit. Instead, it would reinforce typical customer behavior to refuel vehicles overnight at home, incentivizing off-peak charging operations that benefit the grid and resource adequacy while making EV adoption more financially viable for customers.

Pepco is currently developing several Time-of-Use rate proposals in conjunction with the District Department of Energy and Environment as part of the Rate Design Working Group. The forthcoming Working Group report, currently scheduled to be filed under Formal Case 1176 by January 31, 2026, will describe the Residential EV TOU Rate in more detail. The proposal as described here reflects the rate design as currently proposed in the Working Group, but the specific rate design is subject to change. Pepco's eventual application for approval of this rate design will reflect the final design as detailed in the forthcoming Working Group report and will incorporate any guidance or direction from the Commission and comments from stakeholders.

Residential EV TOU Rate	
Portfolio & Initiative	Electrifying Transportation – Rate Solutions
Program Summary	• Residential EV TOU tariff available to EV owners with a Smart Level 2 charger to encourage off-peak charging • Applied to SOS generation service related to EV charging only, as an alternative to whole house R-PIV • Not available with Managed Charging
Target Market & Stakeholders	• Residential customers that own an EV and have a Smart Level 2 charger or on-board vehicle telematics capabilities
Regulatory Framework & Utility Precedent	• Formal Case No. 1130 / 1155 approved R-PIV • Formal Case No. 1155 Pepco DC EV Phase 1 and Phase 2 filings • Pepco MD EV Phase II EV Time-of-Use[15] • Dominion Energy Virginia Off-Peak Plan[16]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2030: 68% of vehicle registrations are ZEV (ACC2) • 2035: 100% of vehicle registrations are ZEV (ACC2)
Customer Value	• **Affordability:** Reduce energy burden • **Reliability**: Manage peak load • **Interactivity**: Integrate smart devices and data
Related Programs	• Residential Charging • Residential TOU Rate

[15] Pepco Maryland, EVsmart
[16] Dominion Energy Virginia, Off-Peak Plan

5.1.3. DCFC Rate Solution

U.S. DOE anticipates that Direct Current Fast Charger (DCFC) charging will make up largest share of EV fueling in urban areas by 2030.[17] Access to fast charging capabilities can encourage EV adoption and enable commuters, taxi and rideshare, commercial operations, and the District's many visitors to opt for electrified transit over conventional vehicles. However, as EV penetration continues to increase, initial utilization of DCFC chargers may be low with only a few charging sessions per month. This can pose a challenge to DCFC operators, who incur disproportionately high demand charges relative to energy charges and charging revenues, presenting a barrier to early adoption of DCFC in the District.

As this gap is expected to shrink as EV usage increases over time, Pepco proposes a rate solution for DCFC operators which will phase out over the next 10 years. The rate would seek to balance fair compensation for the utility's cost of providing continuous capacity to high-rate chargers, with the shared benefit that DCFC stations provide in enabling the EV transition and decarbonization.

To improve DCFC station economics, Pepco will propose a modified demand billing calculation to reduce the demand costs incurred by commercial customers with DC fast chargers and public DCFC operators. The proposed rate will be offered on an opt-in basis, with potential to step down the incentive over time to ease operators back onto normal commercial rates when the rate sunsets. The Company will work with DCFC owners to collect usage data and target price signals to facilitate rate design for an effective solution.

DCFC Rate Solution	
Portfolio & Initiative	Electrifying Transportation – Rate Solutions
Program Summary	• Demand charge rate reform for publicly accessible DCFC chargers with low utilization • Phases out as EVs become more prevalent and utilization rises
Target Market & Stakeholders	• Commercial DCFC owner/operators – both public and private chargers
Regulatory Framework & Utility Precedent	• Formal Case No. 1155 Pepco DC EV Phase 1 and 2 filings
District Goal Alignment	• 2030: 68% of vehicle registrations are ZEV (ACC2) • 2035: 100% of vehicle registrations are ZEV (ACC2)
Customer Value	• **Affordability:** Reduce energy burden • **Affordability:** Promote third-party investment

[17] U.S. DOE EVGrid Assist

	• **Equity:** Increase access to infrastructure, services, and resources • **Interactivity:** Integrate smart devices and data
Related Programs	• Key Corridors Charging

5.1.4. Transit Bus Rate Solutions

The District's ambitious targets for public transit bus electrification are reflective of the large role public transit services will play in cost-effective and equitable decarbonization. Public transportation is a public good, and transportation electrification will provide widespread access to decarbonized services, enabling all customers to participate in the energy transition – especially LMI customers that rely on public transit and often have more limited access to private EV ownership. With over 1,500 public buses operated by Washington Metropolitan Area Transit Authority (WMATA), transit fleet electrification is an opportunity to reduce emissions at scale – including GHG, other air emissions, and noise pollution from conventional vehicle fuels – by addressing a significant number of vehicles and miles traveled. These efforts will yield high-visibility proof points for EV conversion to encourage broader EV adoption by other fleet operators and private vehicle owners.

Besides aligning with District fleet electrification mandates, WMATA has identified bus fleet electrification as a good business practice—an opportunity to modernize its system and improve the efficiency of its system. As the transition accelerates, establishing dedicated rate solutions for electrified public transit fleets will help to manage operational cost impacts to WMATA and its ridership, and encourage charging patterns which effectively manage the grid impact of large-scale EV charging. Pepco will work with WMATA and other relevant stakeholders to prepare for and smooth the transition for all parties. Pepco recognizes the importance of thoughtful rate design especially related to public transit in consideration of high consumption and demand potential, the need for reliability and continuous operations, and keeping affordability front and center for WMATA and its riders in addition to Pepco customers.

Pepco will work with public transit stakeholders to understand operational patterns, demand and capacity needs, conditions at current and planned depots, and other industry specific constraints. In consideration of both public bus fleet and Pepco grid operations, Pepco is working with the DOEE on a proposed rate design in the Rate Design Working Group. The forthcoming Working Group report, currently scheduled to be filed under Formal Case 1176 by January 31, 2026, will describe the proposed rate in more detail. Pepco's eventual application for approval of this rate design will reflect the final design as detailed in the forthcoming Working Group report and will incorporate any guidance or direction from the Commission and comments from stakeholders. It is Pepco's aim to roll out an approved rate for participating public transit agencies in the 5-Year Plan period

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Transit Bus Rate Solutions	
Portfolio & Initiative	Electrifying Transportation – Rate Solutions
Program Summary	• Engage with transit agency and public bus transit stakeholders to study and design rate structure to encourage bus electrification and off-peak charging
Target Market & Stakeholders	• WMATA • DDOT
Regulatory Framework & Utility Precedent	• Hawaiian Electric Bus Rates[18] • Pacific Gas & Electric (PG&E) Commercial EV Rate[19] • San Diego Gas & Electric (SDG&E) EV High Power Charging Rate[20] • Southern California Edison (SCE) Commercial & Industrial EV Rates[21]
District Goal Alignment	• 2030: 50% of public buses and fleets are ZEV (CEDC)
Customer Value	• **Affordability:** Promote third-party investment • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data
Related Programs	• Transit Bus Charging

[18] Hawaiian Electric, Electric Bus Facility
[19] CPUC, Application for Approval of Pacific Gas and Electric Company's Commercial Electric Vehicle Rate
[20] SDG&E, Fleet Friendly Charging Rates
[21] CPUC, Application of San Diego Gas & Electric Company (U 902E) for Approval of SB 350 Transportation Electrification Proposals

EV Make-Ready Upgrades
Customer Incentives

The **EV Make-Ready Upgrades** initiative will provide technical support and rebates for the necessary infrastructure to help connect Pepco customers to multiple forms of electric-based transportation. Simplifying the installation and reducing the costs associated with charging station deployment will provide opportunities for a variety of stakeholders to benefit from the adoption of EVs – including residential and commercial customers, fleet operators, charging station owners and operators, and charging service providers, as well as commuters and visitors from outside the District.

The programs are intended to leverage Pepco's expertise to support design, siting, and integration of a broad range of EV infrastructure requirements. To expedite rollout and reduce red tape, Pepco will provide ancillary support for service upgrades including engineering, design review, and permitting support – standard practice for all Make-Ready Upgrades. Together, these programs will accelerate transportation electrification goals by promoting the use of EVs in the highest-impact parts of the District: on the way to work, on public transit or ridesharing, in local neighborhoods, and at home. The broad applicability of incentives positively affects customers that depend on different forms of mobility, supporting affordability and equity.

Finally, EVs have demonstrated an ability to be an asset to the utility distribution system. To better understand various EV use cases and the correlated impacts the distribution grid, all charging stations receiving an incentive will have smart charging features. These smart chargers will collect and provide detailed insights into the charging behavior of customers (e.g., when chargers are plugged in, the hours in which charging occurs, and when chargers are unplugged), which will improve customer experience during charging and allow Pepco to gain visibility into charging patterns and loads for optimal system planning. These data will inform future Transportation Electrification programs, including bi-directional capabilities and rate design.

5.1.5. EV Make-Ready Site Assessment Services

As customers move to install EV chargers at their homes and facilities, it is Pepco's role to facilitate their integration with the grid in a timely manner. The **EV Make-Ready Site Assessment Services** solution would improve charging station interconnection processes – including siting, review, and approval – to keep pace with customer demand.

For public and private charging deployments, Pepco's proposed program would standardize and streamline interconnection processes through new customer interfaces. The team will advise customers on necessary make-ready service upgrades to enable charger installation, as well as rate plans and programs that could lower installation and operating costs. For larger and more complex installations, such as commercial or public fleet depots, this program would provide enhanced service to support site planning and fleet electrification strategy.

This program is anticipated to conclude after the 5-Year Plan period, following the establishment of streamlined interconnection processes.

EV Make-Ready Site Assessment	
Portfolio & Initiative	Electrifying Transportation – EV Make-Ready Upgrades
Program Summary	• Streamline interconnection review & approval processes for all customers • Provide technical assistance to assess site suitability, estimate upgrade costs, and advise on favorable rates and programs for public and fleet charging projects
Target Market & Stakeholders	• All interconnectors of EV charging infrastructure • Technical assistance for medium- and large-scale commercial customers installing chargers, and transit agencies providing public bus service in the District
Regulatory Framework & Utility Precedent	• Formal Case No. 1155 Pepco DC EV Phase 1-2 EV-Ready System Design & Engineering • Pepco MD EV Phase II Make-Ready Site Assessment Services
District Goal Alignment	• 2030: 50% of public buses and fleets ZEV (CEDC) • 2030: 100% of new public buses purchased ZEV (WMATA) • 2045: 100% of public buses and fleets ZEV (CEDC, WMATA)
Customer Value	• **Affordability:** Promote third-party investment • **Equity:** Increase access to infrastructure, services, and resources • **Sustainability:** Enable electrification
Related Programs	• Key Corridors Charging • Fleet & Taxi Charging • Transit Bus Charging • Destination Charging • Residential Charging

5.1.6. Key Corridors Charging

Charging availability and time to refuel – especially when on the go – are key considerations for drivers when considering EV adoption. Readily accessible public DCFC allows EV drivers and commuters to rapidly refuel and continue, without going out of their way, and is especially valuable for those who may not have dedicated parking with charging onsite or convenient destination charging. Given the unique characteristics of the District as a high-density residential urban center with a large commuting population, District residents and commuters need easy access to DCFC for quick refueling at strategic locations across all wards.

Pepco's DC **Key Corridors Charging** program was approved as part of Pepco's Phase 1 Transportation Electrifying program filed under Formal Case No. 1155. The program delivers rebate incentives Make-Ready upgrades for deployment of publicly available DCFC in strategic, high-utilization traffic corridors to promote visibility and use by residents, commuters, visitors, rideshare drivers, and other EV operators. Due in part to this program, the District now has 51 public DCFC ports at eight locations.[22] However, the program is not yet fully subscribed. Pepco anticipates roll out of additional DCFC under this program in the 5-Year Plan period leveraging remaining program funds in accordance with approved program design. Future DCFC installations can leverage technical assistance under the **EV Make-Ready Site Assessment Services** program to overcome reported siting challenges by Phase 1 participants. As in Phase 1, hosts or charging service providers will be responsible for ownership and operation of charging stations; all chargers will provide data to Pepco to provide visibility into charging patterns and inform future programs.

Facilitating the installation of new EV charging stations along key corridors will help focus investment in potential high-demand, high-utilization areas while increasing accessibility and public visibility to encourage greater adoption of EVs. Anticipating that charging equipment and infrastructure will become more widespread and decline in price over the course of the program, this program is not initially anticipated to be extended into the 10-Year Plan. Rather, Pepco will continue to emphasize smart deployment of accessible Level 2 chargers in future planning periods, as detailed in subsequent programs.

Key Corridors Charging	
Portfolio & Initiative	Electrifying Transportation – EV Make-Ready Upgrades
Program Summary	• Rebates for make-ready upgrades for new smart DCFC at publicly accessible, high-utilization traffic corridors • Increased incentives may be available for DCFC locations in LMI or otherwise under-resourced communities
Target Market & Stakeholders	• Commercial charger owner/operators with publicly accessible site locations in high-utilization traffic corridors
Regulatory Framework & Utility Precedent	• Formal Case No. 1155 Pepco DC EV Phase 1 Key Corridors Charging
District Goal Alignment	• 2030: 68% of vehicle registrations are ZEV (ACC2) • 2030: 50% of public buses and fleets are ZEV (CEDC) • 2035: 100% of vehicle registrations are ZEV (ACC2)
Customer Value	• **Affordability:** Promote third-party investment • **Equity:** Increase access to infrastructure, services, and resources

[22] U.S. DOE Electric Vehicle Charging Station Locations

	• **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification
Related Programs	• EV Make-Ready Site Assessment Services • DCFC Rate Solution

5.1.7. Residential Charging

Although Pepco is working to advance public EV infrastructure in the District, U.S. DOE estimates that 68% of EV charging will take place at home via Level 1 or Level 2 chargers by 2030.[23] Further, Pew Research Center finds that living near EV charging infrastructure is a major influence in purchasing an EV.[17] Pepco can help to activate new EV ownership by providing incentives for make-ready service upgrades to reduce upfront costs associated with installing chargers at single family and existing multi-unit dwelling residences. By accelerating residential charging, EV owners can conveniently charge at home overnight using low-rate systems, allowing both customers and the grid to benefit from off-peak charging. Further, this program will serve to reduce competition for public chargers.

Customers will be eligible for make-ready rebate incentives for Level 1 or smart Level 2 charging at non-commercial residential properties including existing MUD locations.[18] Chargers installed at MUD locations must be reasonably accessible by all EV owners residing at the complex. Increased incentives will be available for projects located in LMI communities.

Level 2 chargers will be required to have "smart" data sharing capabilities. While participating customers will be responsible for ownership and operation of charging stations, all Level 2 chargers will provide data to Pepco to provide visibility into charging patterns and inform future programming. Participants receiving incentives for Level 2 chargers must commit to either TOU rate enrollment or participation in active **Managed Charging** program, pending Commission approval of such programs. Level 1 chargers will require attestation of intended use specific to EV charging.

Anticipating that charging infrastructure will become more widespread and installation and equipment costs will decline, this program is expected to only be needed during the initial 5-Year period and would not be renewed.

Residential Charging	
Portfolio & Initiative	Electrifying Transportation – EV Make-Ready Upgrades
Program Summary	• Rebates for make-ready upgrades at residential and existing MUD properties to support new Level 1 and Smart Level 2 at-home charging

[23] U.S. DOE EVGrid Assist

	• Increased incentives for charging in LMI communities. Requires managed charging or TOU for Level 2 charging
Target Market & Stakeholders	• Residential customers with single-family homes, including those with private garage lots • Owners of existing MUD residences
Regulatory Framework & Utility Precedent	• Formal Case No. 1155 Pepco DC EV Phase 1 DC Residential & DC MUD Charging • Pepco MD EV Phase II Multifamily Make-Ready • Dominion Residential Charger program[24]
District Goal Alignment	• 2030: 68% of vehicle registrations are ZEV (ACC2) • 2035: 100% of vehicle registrations are ZEV (ACC2)
Customer Value	• **Affordability:** Deliver customer compensation • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification
Related Programs	• EV Make-Ready Site Assessment Services • Managed Charging • Residential EV TOU Rate

5.1.8. Destination Charging

For many drivers, charging will take place where cars are parked for extended durations – workplaces, retail establishments, hotels, and other long-term parking locations. Providing Level 2 charging infrastructure at commercial destinations enhances the EV use case for drivers and promotes accessibility for drivers that may not have readily available residential charging. Expanding EV charging infrastructure at commercial locations helps District businesses as well. This program will would allow businesses to provide competitive benefits for employees for EV commuting over conventional passenger vehicles, and encourage foot traffic as drivers patronize businesses close to chargers as they refuel. Overall, distributed Level 2 chargers promote access, functionality, and more positive view of EVs in general,[25] while managing the demand on the grid associated through cost-effective charging that avoids the strain on the grid associated with high-capacity fast charging.

The **Destination Charging** program would encourage the installation of new charging stations for existing commercial facilities by providing rebates to offset make-ready and

[24] Dominion Residential Charger Program
[25] Pew Research Center, Electric Vehicle Charging Infrastructure in the U.S.

site costs for smart Level 2 charging ports.[26] These commercial facilities include parking locations open to the public as well as to a sub-set (e.g., employees at a workplace). To encourage an equitable distribution of charging, increased incentives would be available for charging deployment in publicly accessible locations, in LMI communities, and by small businesses and non-profit organizations. Pepco would provide ancillary support for service upgrades including engineering, design review, and permitting support to support timely interconnection.

While site hosts or charging service providers would be responsible for ownership and operation of charging stations, all chargers would provide data to Pepco to provide visibility into charging patterns and inform future programming.

Anticipating that charging infrastructure will become more widespread and installation and equipment costs will decline, this program is expected to only be needed during the initial 10-Year period and would not be renewed.

Destination Charging	
Portfolio & Initiative	Electrifying Transportation – EV Make-Ready Upgrades
Program Summary	• Rebates for make-ready upgrades for new smart Level 2 charging at commercial locations such as retail, workplace, and curbside • Increased incentives for charging upgrades in LMI communities and by small businesses or non-profits
Target Market & Stakeholders	• Commercial customers • Public charger owner/operators
Regulatory Framework & Utility Precedent	• Formal Case No. 1155 Pepco DC EV Phase 1 Destination Charging • Formal Case No. 1155 Pepco DC EV Phase 1 Opportunity Charging & Curbside Charging • Pepco MD EV Phase II Destination Make-Ready
District Goal Alignment	• 2030: 68% of vehicle registrations are ZEV (ACC2) • 2035: 100% of vehicle registrations are ZEV (ACC2)
Customer Value	• **Affordability:** Promote third-party investment • **Equity:** Increase access to infrastructure, services, and resources • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification
Related Programs	• EV Make-Ready Site Assessment Services

[26] Not available for new commercial facilities, as commercial building owners must implement the requirements in the Electric Vehicle Readiness Amendment Act of 2020, including a minimum level of EV-ready parking spaces. See D.C. Law 23-194. Electric Vehicle Readiness Amendment Act of 2020.

5.1.9. Fleet & Taxi Charging

Fleets such as those used for taxi, rideshare services, and other commercial activities are key targets in electrification to reduce transportation emissions across a large volume of vehicles and miles traveled. Further, electrification of transit vehicles allows non-drivers to participate in and benefit from electrified transportation.

To facilitate the conversion, this program would provide make-ready rebate incentives to support installations of both smart Level 2 and DCFC stations at eligible private sites, in consideration of factors such as fleet size and mileage. Increased rebate values will be available to charging hubs located in LMI communities or at semi-public sites. This program would leverage **EV Make-Ready Site Assessment Services** to help candidate fleet depots evaluate right-sized solutions. Pepco would provide ancillary support for service upgrades including engineering, design review, and permitting support.

While site hosts would be responsible for ownership and operation of charging stations, all chargers would provide data to Pepco to provide visibility into charging patterns and inform future programming. Participants receiving incentives must commit to either participation in the **Managed Charging** program or enrollment in an applicable TOU rate (e.g., **Transit Bus Rates Solutions**), pending Commission approval of such programs.

Anticipating that charging infrastructure will become more widespread and installation and equipment costs will decline, this program is expected to only be needed during the initial 10-Year period and would not be renewed.

Fleet & Taxi Charging	
Portfolio & Initiative	Electrifying Transportation – EV Make-Ready Upgrades
Program Summary	• Rebate incentives for make-ready upgrades to support new private Smart Level 2 and DCFC charging at eligible fleet hubs • Requires managed charging or TOU
Target Market & Stakeholders	• Commercial fleet operators or parking site hosts • DC Department of For Hire Vehicles
Regulatory Framework & Utility Precedent	• Formal Case No. 1155 Pepco DC EV Phase 1 Rideshare & Taxi Charging • Pepco DC EV Phase 2 Fleet, Rideshare & Taxi Charging Hubs program • Pepco MD EV Phase II J40 Fleet Make-Ready
District Goal Alignment	• 2030: 68% of vehicle registrations are ZEV (ACC2) • 2035: 100% of vehicle registrations are ZEV (ACC2)
Customer Value	• **Affordability:** Promote third-party investment • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data

	• **Sustainability:** Enable electrification
Related Programs	• EV Make-Ready Site Assessment Services • Managed Charging • Transit Bus Rate Solutions (if applicable to commercial fleets)

5.1.10. Transit Bus Charging

As detailed in Section 5.1.4, public bus electrification is central to meeting District emissions goals, near-term fleet electrification mandates, and promoting Guiding Principles. Enabling cost effective charging infrastructure will enhance equity in this portfolio by electrifying public transportation services.

To complement the **Transit Bus Rate Solutions** program and promote electrified public transit in the District, Pepco will work with WMATA and DDOT over the 5-year period to (1) assess demand and capacity charging needs of public transit providers and (2) evaluate charger installation, interconnection, and make-ready infrastructure costs at strategic hub and bus depot locations. Based on program planning activities, Pepco aims to launch right-sized rebates to public transit entities. Rebates would be available for eligible and/or site costs for service upgrades to enable new smart charging infrastructure.

While participating transit agencies will be responsible for ownership and operation of charging stations, all chargers will provide data to Pepco to provide visibility into charging patterns and inform future programming. Participants receiving incentives under this solution must commit to either TOU rate enrollment or participation in a **Managed Charging** program, pending Commission approval of such programs. Use of a fleet owner charging management system may be considered.

Acknowledging that transit agencies are currently working on electrifying fleets and building charging infrastructure, and anticipating that installation and equipment costs will decline, this program is expected to only be needed during the initial 5-Year period and would not be renewed.

Transit Bus Charging	
Portfolio & Initiative	Electrifying Transportation – EV Make-Ready Upgrades
Program Summary	• Incentives for make-ready upgrades to support installations of Smart charging at public transit bus hubs/depots • Requires managed charging or TOU
Target Market & Stakeholders	• WMATA • DDOT

Regulatory Framework & Utility Precedent	• Formal Case No. 1155 Pepco DC EV Phase 1 Public Bus Charging • Pepco DC EV Phase 2 Public Bus Charging • Pepco MD EV Phase II Public Transportation Make-Ready
District Goal Alignment	• 2030: 50% of public buses and fleets ZEV (CEDC) • 2030: 100% of new public buses purchased ZEV (WMATA) • 2045: 100% of public buses and fleets ZEV (CEDC, WMATA)
Customer Value	• **Affordability:** Promote third-party investment • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification
Related Programs	• EV Make-Ready Site Assessment Services • Transit Bus Rate Solutions • Managed Charging

5.2. Building Decarbonization
5-Year Plan

GHG emissions from buildings represent the largest source of emissions across all wards, accounting for 72% of total emissions in 2022 (comprised of 69% from commercial buildings and 31% from residential).[27] Substantially decarbonizing this major sector requires near-term efficiency and electrification actions to reduce energy demand and carbon intensity in existing buildings and new construction. Doing so will result in immediate progress towards District goals while delivering compounding grid-wide benefits that complement other portfolios such as **Activating the Local Energy Ecosystem** and **Enhancing Infrastructure for Climate Solutions**. Building load reductions achieved through these programs promote resource adequacy, accelerated clean energy penetration, and reduced energy burden. Meanwhile, building electrification the stage for enhanced smart grid operations and renewables integration.

In the 5-Year Plan period, Pepco plans to roll out a portfolio of **Decarbonizing Buildings** programs comprised of those previously filed under Formal Case No. 1160, subject to analysis via the forthcoming BCA framework. These programs will provide educational and financial resources to (1) reduce customer energy burdens and limit peak demand through customer behavioral changes, (2) support building system efficiency and electrification upgrades, and (3) provide rate solutions. 5-Year Plan programs offer expanded opportunities for LMI customers to participate in the clean energy transition. Based on past successes in the District, the 5-Year Plan incorporates key efficiency opportunities and focuses on appliance and equipment electrification. Pepco expects that this portfolio's solutions will shift primarily to whole-building electrification in the 10- and 15-Year Plan as the most cost-effective measures are addressed in the 5-Year plan.

This portfolio includes programs suited to each target market – residential and commercial – with tailored solutions as follows:

Building Rate Solutions: These programs would encourage customers to conserve through tiered pricing schedules and DR solutions. Rate solutions provide a framework and financial motivator for customers to align behavior with system needs as buildings are increasingly electrified. These programs can help manage grid demand, enhance reliability, and reduce overall system costs while promoting affordability for participating customers.

Behavioral & Technical Solutions: Front-line programs deliver early-stage customer engagement, placing minimal burden on customers while generating significant potential upside. Behavioral programs support reduced energy burdens for high-usage customers and LMI communities through changing usage behavior, leveraging in-person and virtual education and customer portals. Technical

[27] DOEE Greenhouse Gas Inventories

assistance includes baseline energy audits and consultation on BEPS. Serving as an entry point, these programs often introduce customers to additional offerings from Pepco and District stakeholders, guiding them toward deeper energy upgrades, greater long-term savings, and accelerated Pepco program impact. Customer energy initiatives can expect to see increased success when connected with Pepco resources to advise on requirements, best practices, available incentives, and local partners and contractors.

Building Upgrades: These programs offer financial incentives for select efficiency upgrades and conversion to electric building systems. By offsetting upfront costs through targeted rebates, these programs are designed to increase access to, and accelerate customer adoption of, energy-efficient technologies. Incentive programs facilitate permanent changes to energy consumption patterns as building systems are upgraded.

Alignment with Formal Case No. 1160 Energy Efficiency & Demand Response Filing
The programs in the 5-Year Plan for the Building Decarbonization portfolio were developed to address the most urgent needs of each customer sector. Many of these programs were originally proposed in Formal Case No. 1160 with the following goals:

- Comply with cost-effectiveness standards
- Advance the 1.0% annual energy savings target, established in Order No. 20683
- Provide at least 30% of the total program budget towards LMI customers, as required by Order No. 20654

Although the Commission initially approved the Company's EEDR filing in part through Order No. 21417 on August 11, 2022, approval was later rescinded without prejudice under Order No. 21539 pending establishment of a framework to evaluate impact and cost-effectiveness of EEDR programs.

In 2023 Pepco prepared an energy efficiency analysis which estimated a potential achievable cumulative energy savings of 887 GWh by 2032. This represents approximately 8.8% of projected baseline electricity sales in Pepco DC's service area. The EEDR filing under Formal Case No. 1160 proposed programs expected to yield 248.8 GWh of cumulative savings over a three-year cycle, representing 28% of the total achievable potential identified in the study. These estimates have not been updated to account for changes to District and Federal policy, the energy efficiency market, and other factors and trends that have occurred since the analysis was completed in 2023. However, they indicate that customers could realize significant energy and cost savings with the energy efficiency programs Pepco has and will propose.

Following completion of the BCA framework – anticipated in late 2025 – Pepco intends to refile an EEDR plan as outlined in this 5-Year Plan portfolio. The updated filing will further consider the following, as identified in Order No. 22313: shifts in energy consumption; advances in heat pump technologies; the District's carbon neutrality goals; and BCA findings. Subject to program design and BCA evaluation, Pepco anticipates similar results from energy efficiency programs identified in the 5-Year Plan.

Building Rate Solutions
Pepco Programming

As in the Electrifying Transportation portfolio, rate design is a key tool as buildings are electrified to encourage customer load-reduction behaviors and manage energy burden.

Expansion of residential TOU rates would encourage customers to shift their usage to off-peak periods when the grid is less constrained, offsetting the cost burden and demand impacts of electrification. By aligning pricing with grid conditions, TOU rates empower all customers – whether pursuing building upgrades or not – to actively participate in the energy transition while lowering their monthly bills. Billing data garnered from this initiative in the near term would facilitate future rate design improvements for both residential commercial classes.

In addition to TOU pricing, Pepco would expand and improve its DR programs, enabling heating and air conditioning to reduce load in real-time to adjust to grid needs during peak periods. Together with TOU-driven load shifting, interactive DR strategies can bolster grid flexibility and help to meet resource adequacy challenges resulting from building electrification. In the near-term, DR programs leverage customer thermostats to modulate electrified HVAC systems, including heat pumps, which represent the largest consumers in the built environment.[28] In the 10-Year Plan and beyond, DR is expected to expand to other end use applications.

Together, these rate-based and DR strategies complement the electrification and efficiency incentives offered elsewhere in the portfolio, empowering customers to manage their energy costs while contributing to a resilient grid and District decarbonization goals.

5.2.1 Residential TOU Rate

Pepco currently experiences peak electricity demand during the summer months. However, as shown in Pepco's updated electrification study, as electrification increases, particularly from electric heating, peak demand may begin to shift into the winter, creating a need for greater system flexibility year-round. TOU rates can address this by charging higher electricity prices during peak hours and lower prices during off-peak periods. This pricing structure would encourage customers to shift their energy use to off-peak times, helping to flatten demand curves, reduce reliance on expensive and high-emission peaker plants, and support overall grid reliability and resource adequacy. This program proposes establishing residential TOU rates to promote these behavioral changes while giving customers the opportunity to lower their energy bills.

The DC EEDR Study completed in 2023 explored the potential impact TOU rates could have on reducing future peak demand. The results of the study showed that residential

[28] EIA - Use of energy explained

TOU rates could provide in excess of 30 MW of load reduction by the end of 2032, making a meaningful contribution to the District's climate goals.

Pepco is currently developing several Time-of-Use rate proposals in conjunction with DOEE as part of the Rate Design Working Group. The forthcoming Working Group report, currently scheduled to be filed under Formal Case 1176 by January 31, 2026, will describe the Residential TOU Rate in more detail. The proposal as described here reflects the rate design as currently proposed in the Working Group, but the specific rate design is subject to change. Pepco's eventual application for approval of this rate design will reflect the final design as detailed in the forthcoming Working Group report and will incorporate any guidance or direction from the Commission and comments from stakeholders.

Residential TOU Rate	
Portfolio & Initiative	Decarbonizing Buildings – Rate Solutions
Program Summary	• Establish tiered rate applicable to distribution, transmission, and generation charges, offering lower rates during off-peak periods to encourage shifting usage away from peak times and/or invest in technologies that could help offset demand. • Proposal will reflect rate design developed with DOEE in Rate Design Working Group final report.
Target Market & Stakeholders	• Residential customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1130 Residential TOU Rates • Pepco MD Residential TOU Rate[29]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22)
Customer Value	• **Affordability:** Reduce energy burden • **Reliability:** Manage peak load
Related Programs	• Residential EV TOU Rate • Commercial TOU Rate

5.2.2 Commercial TOU Rates

Similar to the Residential TOU Rate described above, Commercial TOU Rates would give customers the opportunity to lower their bills by shifting usage from peak to off-peak periods. Higher prices during peak periods, especially seasonally, combined with lower off-peak prices, would incentivize customers to shift usage or invest in technologies that could help offset some of their demand, such as battery storage. Lowering peak demand, especially during PJM's 5 Coincident Peaks, would reduce supply costs for participating customers and for the grid as a whole, supporting resource

[29] Pepco Maryland, Time of Use Rate

adequacy and reliability and reducing the usage of the most expensive and least clean generation sources.

Pepco is currently developing several Time-of-Use rate proposals in conjunction with DOEE as part of the Rate Design Working Group. The forthcoming Working Group report, currently scheduled to be filed under Formal Case 1176, by January 31, 2026, will describe separate Commercial TOU Rates for customers with different levels of peak demand in more detail. The specific rate designs are still in the process of being developed and are subject to change. Pepco's eventual application for approval of these rate designs will reflect the final design as detailed in the forthcoming Working Group report and will incorporate any guidance or direction from the Commission and comments from stakeholders.

Commercial TOU Rates	
Portfolio & Initiative	Decarbonizing Buildings – Rate Solutions
Program Summary	• Tiered rate applicable to distribution, transmission, and generation charges would offer lower rates during off-peak periods, encouraging customers to shift usage away from peak times and/or invest in technologies that could help offset demand. • Proposal will reflect rate design developed with DOEE in Rate Design Working Group final report.
Target Market & Stakeholders	• Commercial customers
Regulatory Framework & Utility Precedent	• Pepco MD Residential TOU Rates[30]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22)
Customer Value	• **Affordability:** Reduce energy burden • **Reliability:** Manage peak load
Related Programs	• Residential EV TOU Rate • Residential TOU Rate

5.2.3 Thermostat-based Demand Response

Thermostat-based Demand Response programs can offer a cost-effective way to reduce peak demand and enhance grid flexibility during high-demand periods. Smart thermostats enable remote adjustments to temperature set points, reducing heating or cooling use when electricity demand is highest. The program would include two participation options: a bring-your-own-device (BYOD) pathway for customers with existing smart thermostats,

[30] Pepco Maryland, Time of Use Rate

and a rebate option to encourage new adoption. During DR events initiated by Pepco, enrolled customers temporarily reduce HVAC usage, helping to alleviate grid strain. In return, participants earn performance-based bill credits.

Customers would maintain control and comfort, as they can opt out of any event through their thermostat. This flexibility encourages broader participation across both residential and commercial sectors. According to the EEDR Potential Study, this program could deliver up to 94 MW in load reduction from residential customers using the rebate option, 48 MW from BYOD participants, and approximately 7 MW from commercial customers by 2032, assuming maximum participation. This program would evolve into the Demand-Side Management program detailed in the 10-Year Plan.

Thermostat-based Demand Response	
Portfolio & Initiative	Decarbonizing Buildings – Rate Solutions
Program Summary	• Expand existing Energy Wise Rewards DR program to offer a BYOD option for smart thermostats and include commercial customers • Provides bill credits for temporarily turning down HVAC systems when DR events are called
Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1130 Demand Response • Pepco MD Energy Wise Rewards[31] • Baltimore Gas and Electric (BGE) Connected Rewards[32] • National Grid Connected Solutions Thermostat program[33]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2030: Reduce peak demand by 50% (Carbon Free DC) • 2035: 100% new & replacement electric heat and hot water (Carbon Free DC)
Customer Value	• **Affordability:** Deliver customer compensation • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data
Related Programs	• Managed Charging • Direct Load Control Program • Energy Efficient Products • Virtual Power Plant program

[31] Pepco DC, Energy Wise Rewards
[32] BGE, Connected Rewards
[33] National Grid, ConnectedSolutions Thermostat program

5.2.4 Direct Load Control

An alternative to Thermostat-based Demand Response is Direct Load Control. Pepco's existing Energy Wise Rewards program gives participating residential customers bill credits for allowing Pepco to cycle their air conditioners for short periods when demand for electricity is the highest. In contrast to the Thermostat-based Demand Response program, customers cannot opt out of events, but they can unenroll in the program at any time. These customers have a Pepco-installed Direct Load Control Switch, which gives Pepco a unique operational asset that provides vital reliability, emergency planning, and mitigation tools for Pepco to manage its grid and deliver quality service to all customers.

This program is comprised of two parts: modernizing existing equipment and reopening the program to new enrollments. Pepco would modernize the customer-sited Direct Load Control Switches to align timing and technology decisions with District policy priorities. The modernization of this equipment is part of a targeted plan by Pepco to deliver more value to customers already participating in the program, and thus to the electric grid. The investment in this updated hardware would improve the reliability, efficiency, and efficacy of the program, ultimately improving the program's ability to reduce more load. This additional load, as well as load reductions from new customer enrollment, would help lead to system peak savings that could help reduce supply charges in the District overall.

Direct Load Control	
Portfolio & Initiative	Decarbonizing Buildings – Rate Solutions
Program Summary	• Modernize existing customer equipment and reopen the Energy Wise Rewards Direct Load Control program to new enrollment. • Refreshing the customer-sited Direct Load Control Switches aligns timing and technology decisions with District policy priorities. New equipment provides more value to customers already participating in the program, and thus to the electric grid.
Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1130 Demand Response • Pepco MD Energy Wise Rewards[34] • Baltimore Gas and Electric (BGE) Connected Rewards[35] • National Grid Connected Solutions Thermostat program[36]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2030: Reduce peak demand by 50% (Carbon Free DC)

[34] Pepco DC, Energy Wise Rewards
[35] BGE, Connected Rewards
[36] National Grid, ConnectedSolutions Thermostat program

	• 2035: 100% new & replacement electric heat and hot water (Carbon Free DC)
Customer Value	• **Affordability:** Deliver customer compensation • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data
Related Programs	• Thermostat-Based Demand Response • Energy Efficient Products • Virtual Power Plant program

Behavioral & Technical Solutions
Pepco Programming

Energy use is largely dictated by customer behaviors, namely, how and when customers use electricity. As such, behavioral programs are a key component in managing energy consumption, including reducing reliance on fossil fuels for space and water heating in buildings. To facilitate this transition, customers must first understand their energy usage, operational needs, and available technologies and resources.

Technical assistance programs build on behavior-based efforts to help customers plan and execute their energy initiatives. These programs would provide audits and diagnostic testing to evaluate a building's specific characteristics to establish an accurate energy baseline and identify targeted strategies to reduce consumption and meet compliance with District BEPS and NZE standards. Technical assistance programs would also connect participants with resources available through Pepco and other District providers to identify eligible equipment, claim available tax credits and incentives, and connect with qualified local contractors. Through tailored technical recommendations, these programs help customers take informed next steps to boost the likelihood of successful outcomes for building energy upgrades. The behavior-based programs outlined below are designed to close the knowledge gap and serve as an entry point for customers beginning their energy conservation journey in partnership with Pepco.

Pepco Marketplace

The Pepco Marketplace is an online landing page which serves as a one-stop shop for Pepco resources available for customers, including technical information, rebates, and qualified local contractor and vendor directories. The Pepco Marketplace has been proven to be successful in Maryland, providing customers instant online rebates on energy efficiency products and helping them take charge of their energy usage through links to portals and tools to build a home that's comfortable and connected.

5.2.5 Schools and Education

The 2023 DC Environmental Literacy Plan established a solution for the District, outlining a roadmap to integrate environmental education into the K-12 curriculum District-wide. Pepco's **Schools and Education** solution would be a compliment to this plan, engaging students, families, and educators from local schools through curriculum-aligned teaching materials and hands-on learning in energy efficiency. Participating teachers would receive standards-based resources, while students will be provided with take-home kits containing simple energy-saving measures.. Families would also receive information on additional Pepco energy efficiency programs, and upon completing the activities, each student household earns a credit to be used on the Pepco Marketplace. Students may also take part in a science-based capstone activity that reinforces the lessons through real-world application.

The **Schools and Education** program has been proven to deliver strong customer value in Maryland by advancing equity though energy literacy among students, educators, and families, empowering them to make informed decisions about energy use. By introducing low- or no-cost energy-saving measures and encouraging participation across diverse populations, the program promotes long-lasting energy-efficient behaviors at home and in the community. This early exposure helps set lasting habits that contribute to household savings and broader District energy goals.

Schools and Education	
Portfolio & Initiative	Decarbonizing Buildings – Behavioral & Technical Solutions
Program Summary	• Provide curriculum-aligned materials, hands-on activities, and take-home energy efficiency kits to promote energy-saving behaviors • Families receive additional energy-saving resources and a Marketplace credit upon completion
Target Market & Stakeholders	• Residential customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1160 for energy efficiency programs • Pepco MD Energize Education program[37]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2032: Reduce energy use by 50% (CEDC Act)
Customer Value	• **Affordability:** Reduce energy burden • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Sustainability**: Encourage efficiency
Related Programs	• Rate Solutions • Behavioral & Technical Solutions • Building Upgrades

5.2.6 Commercial Customer Portal

Commercial buildings are the largest source of emissions in the District, accounting for nearly half of all emissions in 2022. The **Commercial Customer Portal** would provide a no-cost, opt-in behavioral solution targeted toward this sector to help meet the District's efficiency and electrification targets while recommending actionable bill savings opportunities. As envisioned, the portal can empower commercial customers of all sizes to reduce energy consumption by providing education, engagement, and data-driven insights. Through the Customer Engagement Portal, participants would receive personalized energy reports, access to self-serve tools, and energy advisor coaching to

[37] Pepco Maryland, Energize Education

support behavioral changes that lead to measurable savings. The program focuses on high-usage commercial customers, helping them make informed decisions, lower utility costs, and build a stronger relationship with Pepco.

Commercial Customer Portal	
Portfolio & Initiative	Decarbonizing Buildings – Behavioral & Technical Solutions
Program Summary	• Provide customers with energy reports, energy coaching through a Customer Engagement Portal to promote behavioral savings • Connects customers with supplemental Pepco & DOEE programs
Target Market & Stakeholders	• Commercial customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1160 for energy efficiency programs • Pepco Business Energy Manager[38]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2032: Reduce energy use by 50% (CEDC Act)
Customer Value	• **Affordability:** Reduce energy burden • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Sustainability**: Encourage efficiency
Related Programs	• Rate Solutions • Behavioral & Technical Solutions • Building Upgrades

5.2.7 No-Cost Home Energy Reports

In 2022, residential energy accounted for 31% of the building sector's GHG emissions within the District, per DOEE. Pepco will propose the No-Cost Home Energy Report program to help address this by using advanced metering infrastructure (AMI) data and modeling techniques to generate free personalized home energy reports for residential customers. Each report compares a customer's electricity usage to approximately 100 similar, nearby District homes and offers tailored energy-saving tips and behavioral recommendations. The reports will highlight complementary programs available through Pepco or other District stakeholders available for more advanced energy measures in the home. As a free program with no required site visit, these resources would be readily accessible to all residential customers that have received a smart meter.

This program would provide customers with valuable insights into their home's energy use by showing how their consumption and carbon impact compares to similar

[38] Pepco, Business Energy Manager

households, which can further serve to "gamify" and incentivize behavioral modifications. The personalized recommendations and resources would empower customers to make informed decisions that lower utility bills, manage grid demands, and support District climate goals.

No-Cost Home Energy Reports	
Portfolio & Initiative	Decarbonizing Buildings – Behavioral & Technical Solutions
Program Summary	• Leverage Pepco's AMI data to deliver personalized Home Energy Reports, comparing customer usage to that of similar households and offer tailored recommendations to reduce energy burden • Connects customers with Pepco & DOEE programs to expand impact
Target Market & Stakeholders	• Residential customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1160 for energy efficiency programs • Formal Case No. 1056 governs Pepco's implementation of AMI including smart meters • Potomac Edison Company Home Energy Analyzer[39]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2032: Reduce energy use by 50% (CEDC Act)
Customer Value	• **Affordability:** Reduce energy burden • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Sustainability**: Encourage efficiency
Related Programs	• Technical Assistance programs • Incentives programs • Rates & DR programs

5.2.8 Quick Home Energy Check-Up

In-home energy audits are an effective way to identify specific inefficiencies such as poor insulation, outdated HVAC systems, and inefficient lighting. Pepco will propose the **Quick Home Energy Check-Up** (QHEC) program to offer no-cost, in-home assessments to help reduce energy burden for residential customers. Under the program, a certified technician would conduct a visual inspection and install energy-saving measures during the visit, delivering immediate energy savings and helping to reduce demand on the electric grid.

The program will would offer additional services for LMI customers through more comprehensive audits, and HVAC tune-ups offered through partnerships with local qualified contractors. Through targeted engagement in high-density LMI areas the QHEC

[39] Potomac Edison, Home Energy Analyzer

program promotes equity and ensures underserved households can benefit from energy-saving opportunities. This program can play a vital role in advancing equitable access to energy savings measures, reducing peak demand, and enhancing long-term affordability for all residential customers.

Quick Home Energy Check-Up	
Portfolio & Initiative	Decarbonizing Buildings – Behavioral & Technical Solutions
Program Summary	• Free in-person energy audits with direct install measures and custom reports • Qualifying LMI customers are offered HVAC tune-ups • Supports local workforce through contractor partnerships
Target Market & Stakeholders	• Residential customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1160 for energy efficiency programs • Pepco MD QHEC program[40]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2032: Reduce energy use by 50% (CEDC Act)
Customer Value	• **Affordability:** Reduce energy burden • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Sustainability**: Encourage efficiency
Related Programs	• Rate Solutions • Behavioral & Technical Solutions • Building Upgrades

5.2.9 Home Performance

Due to the age of much of the existing housing stock and limited space for new development, retrofitting existing homes is essential to meeting the District's housing and climate goals. Preserving, rehabilitating, and modernizing these homes is a critical pathway to promoting safe, affordable, and sustainable housing. The Carbon Free DC plan highlights deep energy retrofits as a key strategy to reduce energy use, lower GHG emissions, and improve long-term affordability for residents across the District.

The **Home Performance** program will would offer a comprehensive, two-step "whole house" approach to improving energy efficiency, comfort, and affordability in residential buildings.

[40] Pepco Maryland, Quick Home Energy Check-Up

1. The program would begin with a low cost diagnostic **Home Performance Audit** conducted by a certified auditor to identify opportunities for energy savings and health and safety improvements.
2. Customers can could then opt to complete a **Home Performance Job** with a qualified contractor to implement energy upgrades such as insulation, duct sealing, and high-efficiency HVAC or water heating equipment. Available incentives would be provided to reduce project cost, based on measured energy savings.

In addition to improving occupant comfort, **Home Performance** upgrades would immediately reduce energy burden for participants, load on the grid, and onsite fossil fuel usage. The program would further advance equity and affordability by offering enhanced incentives for more comprehensive weatherization measures at income-qualified (i.e., LMI) households.

Home Performance	
Portfolio & Initiative	Decarbonizing Buildings – Behavioral & Technical Solutions
Program Summary	• Discounted, more comprehensive home energy audit followed by performance-based upgrades and pay for performance incentives based on measured savings • Enhanced solutions available for LMI customers, including LMI weatherization upgrade implementation to reduce energy burden • Supports local workforce through contractor partnerships
Target Market & Stakeholders	• Residential customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1160 for energy efficiency programs • Pepco MD Home Performance with ENERGY STAR program[41]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2032: Reduce energy use by 50% (CEDC Act) • 2035: 100% new & replacement electric heat and hot water (Carbon Free DC)
Customer Value	• **Affordability:** Reduce energy burden • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Sustainability**: Encourage efficiency
Expected GHG Emissions Impact	• Supports reduction in **customer Scope 1** emissions from reduction in onsite fuel usage. • Supports reduction in **Pepco and customer Scope 2** emissions from the decrease in electricity usage.

[41] Pepco Maryland, Home Performance With ENERGY STAR® program

Related Programs	• Rate Solutions • Building Upgrades

5.2.10 Commercial New Construction Code Support

With the adoption of BEPS under the CEDC Act and NZE construction codes under the CEDC Act Building Code Amendment Act of 2022, builders, contractors, and developers in the District face new compliance challenges. To support contractors in navigating the new code, Pepco would provide technical assistance as part of the **Commercial New Construction Code Support** program. Through workshops, webinars, on-demand trainings, and an online resource portal, the program would equip design and construction professionals with tools and guidance on energy-efficient design and applicable BEPS. Pre-construction plan reviews and on-site consultations would further help ensure that commercial projects meet or exceed energy code standards.

A code support program has the potential to influence higher build quality, increase resilience against temperature and fuel price shocks, offer safer and healthier buildings, and reduce energy bills, all contributing to resource adequacy, reduced GHG emissions, and increased reliability.

Commercial New Construction Code Support	
Portfolio & Initiative	Decarbonizing Buildings – Behavioral & Technical Solutions
Program Summary	• Offers free guidance and tools to local builders, contractors, and developers to help understand and comply with District BEPS and NZE codes for covered buildings
Target Market & Stakeholders	• Commercial customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1160 for energy efficiency programs • Xcel Energy's Energy Codes and Standards program[42]
District Goal Alignment	• 2026: 100% of new buildings are net-zero energy (CEDC) • 2030: Reduce GHG emissions by 60% (CCA22) • 2035: 100% new & replacement electric heat and hot water (Carbon Free DC)
Customer Value	• **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification
Related Programs	• Rate Solutions • Building Upgrades

[42] Xcel Energy, Energy Codes & Standards program

Third-Party Energy Program Support

To complement the programs outlined in this portfolio, Pepco may offer technical assistance to help homeowners, landlords, and businesses understand available third-party incentives including those offered by DOEE, DCSEU, the Commission, and Federal energy programs. This support can include consultations on eligible improvements, such as electric heat pumps water heaters and building envelope components.

In addition to one-on-one support via established technical assistance programs, Pepco may host educational workshops, webinars, and online resources that detail available third-party programs and best practices in coordinating with program providers and local contractors. Pepco would serve as a facilitator in this space to expand the reach and impact of existing programs offered by stakeholders that can support the transition to a more energy-efficient and sustainable future within the District.

In particular, Pepco will build on its previous success in collaborating with DOEE, DCSEU, and relevant stakeholders to provide appropriate resources, in consideration of impacts of the 2025 change in U.S. administration and major Federal legislation, District budget changes to energy program funding, and other external market factors.

Building Upgrades
Customer Incentives

When paired with the behavioral and technical assistance programs described above, customer incentives can drive widespread adoption of building technologies which are more efficient, all-electric, and more interactive. Incentives will enable the energy transition by facilitating adoption of advanced energy systems that balance load reduction with electrification.

More efficient electric appliances deliver energy bill savings over time, but the upfront investment required can present a barrier, especially if systems are not yet nearing replacement. Rebates can motivate building owners to upgrade their systems through direct reimbursement or reduction in sticker price. The cost of electrification upgrades can be heightened by required electrical upgrades. As part of the **Building Upgrades** initiative, Pepco proposes "make-ready" service upgrades to support the installation of electric heating and hot water systems, especially in LMI households.

Some of these programs are similar to programs offered by the DC Sustainable Energy Utility (SEU). Recognizing statutory requirements,[43] Pepco has engaged the DC SEU throughout the development of the Climate Solutions Plan. The incentives Pepco is proposing are meant to be additive to any programs the SEU offers or may offer in the future, not conflict with them in any way. Pepco will continue to collaborate with the SEU on how to best lower barriers to deployment and increase the uptake of these technologies and solutions. The structure of the programs described here is subject to change based on evolving discussions and future policy changes.

[43] 8 DC Code 1774.07

5.2.11 Efficient Products Incentives

The **Efficient Products Incentives** program would provide instant, point-of-sale incentives to increase customer adoption of high-efficiency residential and commercial products, including electrified appliances. This program is envisioned to provide midstream incentives, or incentives paid directly to distributors or retailers which then pass the savings on to customers in the form of price discounts.

For residential customers, the program would provide rebates on energy efficient appliances such as heat pumps, smart thermostats, induction stoves, dryers, and electric lawn equipment. Rebates would be processed directly through contractors and retailers, including the Pepco Marketplace, ensuring savings are passed to customers at the time of purchase. As disposal of existing appliances represents an added cost – and an environmental burden, if improperly handled – the program would also include recycling options for those appliances being replaced. Increased rebate values may be made available for households that can demonstrate they are income qualified.

Heat Pumps

Modern cold-climate heat pumps operate efficiently in all seasons, making them a viable alternative to fossil fuel systems across a wider range of building types to enable cross-sector building electrification. In the 5-Year Plan incentives will be available for dual-fuel heat pump systems, which combine electric heat pumps with backup fossil fuel systems, offering flexibility and optimized cost savings based on real-time energy prices and usage patterns. These systems can be particularly cost-effective for customers in older homes or in situations where full electrification may not be immediately feasible.

For commercial customers, the program encourages adoption by offering instant rebates at the distributor level on qualifying products such as lighting, HVAC, and kitchen equipment, making it especially valuable to contractors and maintenance staff managing large facilities. These solutions reduce upfront costs, eliminate rebate application barriers, and help accelerate the transition to more efficient, electrified technologies across customer segments.

Pepco's proposed midstream strategy serves to reduce both upfront cost to customers as well as burden associated with submitting for rebate reimbursement. Midstream programs have demonstrated substantial increases in engagement over downstream incentives in other markets. For example, in comparison to downstream rebate programs, Efficiency Maine saw a 423% increase in participation for its ENERGY STAR® Certified Heat Pump Water Heater program, while Energize Connecticut reported a 1,000% increase for its Heat Pump Water Heater program.[44]

This program is expected to phase out or evolve after the 5-Year Plan period in favor of electrification focused incentives, rather than efficient products.

[44] ENERGY STAR - Examine Surges in Participation at Distributor-Focused Midstream programs

Efficient Products Incentives	
Portfolio & Initiative	Decarbonizing Buildings – Building Upgrades
Program Summary	• Midstream incentives for efficient and electrified equipment, available to customers as discounted point-of-sale prices • Increased instant rebates incentives available for LMI customers via Peco Marketplace • Includes recycling service for replaced appliances
Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1160 for energy efficiency programs • Pepco MD Marketplace[45] • Pepco MD Business Instant Discounts[46]
District Goal Alignment	• 2026: 100% of new buildings are net-zero energy (CEDC) • 2030: Reduce GHG emissions by 60% (CCA22) • 2032: Reduce energy use by 50% (CEDC Act) • 2035: 100% new & replacement electric heat and hot water (Carbon Free DC)
Customer Value	• **Affordability:** Deliver customer compensation • **Affordability:** Reduce energy burden • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification • **Sustainability**: Encourage efficiency
Related Programs	• Electrification Make-Ready • Thermostat-based Demand Response • Commercial Prescriptive & Custom Incentives

5.2.12 Electrification Make-Ready

Many of the buildings in the District rely on aging electric utility service connections that were not designed to accommodate the new load growth presented through electrification. These constraints result in reliability issues and operational limitations for customers. The **Electrification Make-Ready** program would be available for both

[45] Pepco, Marketplace
[46] Pepco, Business Instant Discounts

commercial and residential customers where electrical infrastructure upgrades are needed to enable the transition to electric appliances and building electrification.

For commercial customers, the program would provide rebates for front-of-meter distribution system upgrade costs, including utility-owned equipment such as conduit and cable, and customer-owned infrastructure like transformers, panels, and switchgear required to meet increased electric demand. For residential customers, the program would offer behind-the-meter rebates for upgrades such as panel replacements and wiring improvements needed to support electrification of space heating, water heating, EVs, and cooking equipment. This program would facilitate equitable access to infrastructure modernization and electrification by reducing upfront costs and ensuring buildings are ready for clean energy technologies.

Electrification Make-Ready	
Portfolio & Initiative	Decarbonizing Buildings – Building Upgrades
Program Summary	• Rebates for upgrades that are necessary to accommodate increased load from electrification
Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• Xcel's Electric Panel Upgrade program[47] • Silicon Valley Power's Electric Panel Upgrade Rebate[48]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2035: 100% new & replacement electric heat and hot water (Carbon Free DC)
Customer Value	• **Affordability:** Deliver customer compensation • **Equity:** Increase access to infrastructure, services, and resources • **Sustainability:** Enable electrification
Related Programs	• Efficient Products Incentives

5.2.13 Commercial Prescriptive & Custom Incentives

The District is home to facilities of all ages and functions, and so commercial customer energy and operational needs vary widely. This multi-faceted incentive program is envisioned as a "one-stop shop" for prescriptive, custom, and retro-commissioning pathways to support commercial energy upgrades initiatives of all sizes and types.

The prescriptive track would expand on products not offered under the Efficient Products midstream program and allow for a more customized approach to reducing energy usage,

[47] Xcel Energy, Electrical Panel Upgrade & Home Rebates
[48] Silicon Valley Power. Rebates

providing downstream incentives for a more diverse set of high-efficiency equipment such as HVAC units, variable frequency drives, refrigeration systems, and energy controls.

The custom track would support more complex or specialized projects, such as fuel-switching, by offering enhanced incentives based on calculations of expected energy savings resulting from high-efficiency technologies not readily available through the marketplace.

Small businesses – generally defined as commercial customers with an average monthly demand of less than 100 kW – often face resource constraints which can create barriers to energy upgrades or exacerbate energy burden. To support small businesses, this solution would include a no-cost energy check-up, direct installation of low-cost measures, retrofit opportunities, and HVAC tune-up services. An on-bill financing option would be available to help small businesses manage upfront costs by spreading remaining costs across future utility bills.

This multi-pronged approach would support deep energy savings, reduced operating costs, and increased participation across a diverse commercial customer base. This program is expected to evolve after the 5-Year Plan period in favor of electrification focused incentives, rather than efficiency.

Commercial Prescriptive & Custom Incentives	
Portfolio & Initiative	Decarbonizing Buildings – Building Upgrades
Program Summary	• Downstream prescriptive, custom, and retro-commissioning incentives aimed are retrofitting existing commercial buildings • Small business component offers a quick energy check-up and direct install services with on-bill financing opportunities for larger equipment upgrades
Target Market & Stakeholders	• Commercial customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1160 for energy efficiency programs • Pepco MD Medium and Large Businesses program[49] • Pepco MD Small Business program[50]
District Goal Alignment	• 2030: Reduce GHG emissions by 60% (CCA22) • 2032: Reduce energy use by 50% (CEDC Act) • 2035: 100% new & replacement electric heat and hot water (Carbon Free DC)
Customer Value	• **Affordability:** Deliver customer compensation • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load

[49] Pepco, Medium and Large Business
[50] Pepco, Small Business

	• **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification • **Sustainability**: Encourage efficiency
Related Programs	• Efficient Products Incentives • Behavioral & Technical Solutions

5.2.14 Residential New Construction & Major Renovations

The **New Construction and Major Renovation** program would incentivize builders and developers in the residential sector to construct high efficiency single-family homes and small multifamily buildings, and to consider energy efficiency in design of major renovation projects. Because many residential sector projects are otherwise not subject to BEPS, the program is envisioned to promote achievement of similar standards. Incentives would be made available to developers to encourage energy performance measures such as insulation, high efficiency windows, pre-wiring for EV charging, high-efficiency electric equipment, and much more. These incentives would work to improve the economics of developer or builder investment in above-standard design elements. Applicable project incentives would be determined based on savings of the constructed home vs the same home modeled to the latest energy code. Savings would be verified by a third-party home energy rater in an approved modeling software.

Residential New Construction & Major Renovations	
Portfolio & Initiative	Decarbonizing Buildings – Building Upgrades
Program Summary	• Comprehensive design support for builders and developers to incorporate best practice energy design, systems, and technology, into residential new builds and major renovations • Incentives calculated based on the modeled energy savings over a design baseline, subject to verification
Target Market & Stakeholders	• Builders and developers of residential properties, including single family and small multifamily buildings
Regulatory Framework & Utility Precedent	• Formal Case No. 1160 for energy efficiency programs • Pepco MD ENERGY STAR New Homes program[51] • Pepco MD New Construction and Major Renovations[52]
District Goal Alignment	• 2026: 100% of new buildings are net-zero energy (CEDC) • 2030: Reduce GHG emissions by 60% (CCA22) • 2035: 100% new & replacement electric heat and hot water (Carbon Free DC)
Customer Value	• **Affordability:** Promote third-party investment • **Reliability:** Manage peak load

[51] Pepco, ENERGY STAR® New Homes Program
[52] Pepco, New Construction and Major Renovations

	• **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification • **Sustainability**: Encourage efficiency
Related Programs	• N/A

5.3 Activating the Local Energy Ecosystem

5-Year Plan

The **Activating the Local Energy Ecosystem** portfolio is comprised of customer-oriented programs to expand solar deployment and DER utilization in the District. In the 5-Year Plan, the Company would provide public-facing technical resources to shorten the planning period – facilitating selection of cost-effective, feasible DER locations and streamlining interconnection approvals – as well as financial resources to establish a favorable investment environment. This approach would accelerate adoption of local energy generation and storage technologies, which is essential to the interactive grid promoted by the **Enhancing Infrastructure for Climate Solutions** portfolio.

Pepco's near-term programs are comprised of:

- **Interconnection Solutions:** Provide Company-hosted technical resources and initiatives to equip developers and customers with the information and utility inputs needed to site projects and execute cost-effective and timely interconnections.
- **DER Upgrades:** Establish multi-pronged financial mechanisms in the form of rebates and pay-for-performance programs to incentivize battery installation that complements and maximizes renewable energy generation in the District. This initiative aims to increase accessibility of DERs and their upside to all customers.

In the 5-Year Plan, this portfolio advances programs that address administrative and operational pain points experienced by customers interconnecting DERs. By clearing known obstacles Pepco can establish proof points to encourage new adopters. These successes will further inform future solutions such as improved data tools, Pepco's technical interconnection review and approval workflows for larger systems, and supplemental shared services or pay-for-performance DER programs.

Interconnection Solutions
Pepco Programming

In the first 5 years, Pepco would build on existing tools, data, and processes to facilitate and expand interconnection of DERs. While Pepco is responsible for connecting electric service to users, customer-driven DER deployment is essential to reach the District's local solar generation goals. Through the **Interconnection Solutions** initiative, Pepco seeks to provide technical expertise and planning information to alleviate unnecessary burden and risk – including technical, financial, and schedule risk – from the interconnection process and facilitate DER expansion. As the scale and complexity of customers' behind-the-meter DERs continues to increase, it is Pepco's role to work effectively with customers and developers to integrate new DERs into the distribution system safely, reliably, and expeditiously to meet District timelines.

5.3.1 DER Hosting Capacity Maps

For customers and developers looking to invest in DERs, understanding the ability of the grid to accommodate a new system at a proposed location is essential. Pepco plays a central role in transparently providing customers and DER developers with decision-making data to facilitate system siting and deployment. Pepco will finalize efforts currently underway to improve existing **DER Hosting Capacity Maps** and complementary mapping and DER interconnection criteria resources. Pepco will complete ongoing improvements to existing data granularity and quality, expand information collection from interconnected DERs, automate updates for new interconnections, and improve data processing and storage capabilities. To date, Pepco has implemented a number of mapping improvement efforts. Outstanding enhancements will look to expand the published information on small DER capacity to promote residential and commercial customer deployment within the District.

DER Hosting Capacity Maps	
Portfolio & Initiative	Activating the Local Energy Ecosystem – Interconnection Resources
Program Summary	• Expand existing map data to enhance customer utility with a focus on enabling small-scale DER interconnection to promote local solar • Modifications & additions include: small DER and reserve capacity; single-phase vs. three-phase; territory boundaries; pre-application data access for developers • Combine all public-facing PHI maps (including hosting capacity, heat, load, and restrictions) on a single page and update monthly.
Target Market & Stakeholders	• All customers • Third-party developers

Regulatory Framework & Utility Precedent	• This program is an enhancement and extension of Pepco DC's Distributed Energy Resources maps fulfilling Merger Commitment 120(a) from Order No. 18160 in Formal Case No. 1119 • Pepco DC Hosting Capacity Map[53] • Dominion Energy Hosting Capacity Tool[54]
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Affordability:** Promote third-party investment • **Reliability:** Contribute to resource adequacy • **Equity:** Increase access to infrastructure, services, and resources • **Sustainability:** Integrate clean energy
Related Programs	• Public-Facing Interconnection Queue Initiative • Billing Automation • Monthly Project Cost Variance Report Initiative

5.3.2 Public Facing Interconnection Queue Initiative

The **Interconnection Queue Report Initiative** will enhance how Pepco assigns and manages queue positions for DER interconnection applicants, improving the data points available to developers prior to submission of applications and throughout projects' end-to-end lifecycle. This will enable developers to make sound decisions when determining investment in Pepco jurisdictions, supporting Pepco's growth strategy.

Pepco will create a multi-jurisdictional queue report from a single DER database that will centralize Pepco's interconnection data across all jurisdictions – DC, Maryland, Delaware, and New Jersey. Pepco will also put processes in place to track more data points throughout the interconnection process. The report will be used to create a Pepco Jurisdictional Interconnection Queue that will be published to Pepco's website and available to the public. It will also be used by internal teams to ensure Pepco is working from the same data that is available publicly, providing transparency and accountability to developers. These improvements will help Pepco provide a better interconnection experience by ensuring fairness, transparency, and operational efficiency. Pepco will continue to maintain this public interconnection queue beyond the 5-Year Plan timeframe.

Public Facing Interconnection Queue Initiative	
Portfolio & Initiative	Activating the Local Energy Ecosystem – Interconnection Resources
Program Summary	• Enhanced queue management for DER interconnection applicants improves the data points available to

[53] Pepco DC Hosting Capacity Map
[54] Dominion Energy Hosting Capacity Tool

	developers prior to submission of applications and throughout a project's end-to-end lifecycle. • Increased and improved data enables improved decision-making for developers when determining whether to invest in Pepco's jurisdiction, supporting growth.
Target Market & Stakeholders	• DER developers
Regulatory Framework & Utility Precedent	• NJ BPU Interconnection Rules Updates[55]
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Affordability:** Promote third-party investment • **Reliability**: Contribute to resource adequacy • **Equity:** Increase access to infrastructure, services, and resources • **Sustainability:** Integrate clean energy
Related Programs	• DER Hosting Capacity Maps • Billing Automation • Monthly Project Cost Variance Report Initiative

5.3.3 Monthly Project Cost Variance Report Initiative

The **Monthly Project Cost Variance Report Initiative** for DER projects will provide detailed monthly variance reports that track key project performance metrics. These reports will help Pepco gain more insight into its projects to better understand project performance. This added insight will allow Pepco to take corrective action when needed to improve project timelines and efficiency, resulting in an improved interconnection experience. This initiative also promotes transparency by sharing information with developers and regulators about cost drivers and project timelines. An anticipated outcome of better project timelines and increased transparency is higher developer confidence in Pepco's interconnection process, resulting in developers continuing to invest in Pepco's jurisdictions. After implementing this functionality in the 5-Year Plan, Pepco expects to continue this initiative beyond the 5-Year timeframe.

Monthly Project Cost Variance Report Initiative	
Portfolio & Initiative	Activating the Local Energy Ecosystem – Interconnection Resources
Program Summary	• Provide monthly variance reports tracking key project performance metrics for DER projects.

[55] NJ BPU Docket No. Q021010085, Order No. 8-13-25-8C

	• Enables Pepco to take corrective action to improve project timelines. • Increased transparency will help lead to higher developer confidence in Pepco's interconnection process, resulting in developers continuing to invest in Pepco's jurisdiction.
Target Market & Stakeholders	• DER developers
Regulatory Framework & Utility Precedent	• RM40-2024-01-E-29
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Affordability:** Promote third-party investment • **Reliability:** Contribute to resource adequacy • **Equity:** Increase access to infrastructure, services, and resources • **Sustainability:** Integrate clean energy
Related Programs	• DER Hosting Capacity Maps • Public-Facing Interconnection Queue Initiative • Billing Automation

5.3.4 Microgrid Siting Solutions

As customer DERs are brought online in the District to meet policy goals and build resource adequacy, pairing these assets with energy storage, smart controls, and islanding capability to form microgrids can protect vulnerable communities. Microgrids offer resiliency solutions to customers by allowing local generation from their DERs to be used as clean backup power in the event of a grid disturbance. During normal operations, DER assets in the microgrid can enable peak demand reduction, load shifting, and participation in DR and virtual power plant events, generating value for the customer as well as the broader grid. These benefits further bolster resilience and resource adequacy with the option to island from the grid in periods of constrained supply, helping to avoid distribution system strain or outages. As such, promoting customer microgrids in the District is key to increasing renewable energy utilization and increasing grid resiliency.

Pepco is supporting microgrid pilots currently in development within the District, which will offer lessons learned for future pilots and microgrid integrations. In the near-term and in no particular order, Pepco will lead a series of efforts to identify and evaluate potential customer microgrid locations in consideration of factors such as (a) community needs, (b) potential grid impacts, (c) planned or installed DER facilities, (d) interconnection feasibility, (e) inclusion of public facilities, (f) accessibility for community members, and (g) LMI status. Findings may inform future Company planning efforts including

infrastructure deployment under the **Enhancing Infrastructure for Climate Solutions** portfolio. This program may also enable tailored data collection from ongoing microgrid initiatives.

Microgrid Siting	
Portfolio & Initiative	Activating the Local Energy Ecosystem – Interconnection Resources
Program Summary	• Identify priority sites for next tranche of customer-facing microgrid development (pilot or full scale) based on outage frequency and duration, capacity, and load • Evaluate and prioritize sites based on feasibility, cost, and benefit, informed by Guiding Principles and BCA • Additional consideration for potential microgrid sites serving LMI communities • Incorporate findings into capital plans such as 10-15YP and IDSP for implementation
Target Market & Stakeholders	• All customers within microgrid boundaries • Stakeholders vary based on identified candidate sites
Regulatory Framework & Utility Precedent	• Formal Case No. 1163 Microgrid Regulatory Framework • Formal Case No. 1130 PowerPath DC Transactive Neighborhood Renewable Microgrid Pilot Project, currently in pre-development[56] • PG&E Community Microgrid Incentive Program (MIP)[57]
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Equity:** Distribute benefits across communities
Related Programs	• DER Hosting Capacity Maps • IDSP Planning & Forecasting • Grid-Facing BESS

5.3.5 Microgrid Standby Tariff

On August 1, 2023, in compliance with the Commission's directive in Formal Case No. 1163 to update the existing Standby Service (Schedule S) to accommodate DERs focused on microgrids, Pepco filed a proposed tariff amendment to replace Schedule S with a new Standby Service Rider (Rider S). After going through a series of comment periods, and a new order from the Commission to file supplemental rate design support information, Pepco made the filing, as directed, on July 28, 2025. At the time of this filing, Pepco is still awaiting a response from the Commission on its latest filing pertaining to

[56] DCPSC Transactive Neighborhood Renewable Microgrid Pilot Project
[57] PG&E Community Microgrids

Rider S but hopes to receive approval and begin offering the tariff in the 5-Year Plan period.

The **Microgrid Standby Tariff** is for customers who are primarily served by behind-the-meter microgrid systems but continue to rely on the utility distribution system for backup power, supplemental capacity, or other grid services. As the adoption of DERs and customer-sited microgrids grows, Pepco recognizes the need for a tailored standby rate structure that equitably reflects the cost of maintaining grid services while encouraging continued investment in local energy resilience, grid peak load reduction, and renewables within the District.

Under this proposed rate, participating eligible customers would be assessed charges for the availability of the utility service based on peak demand served by the microgrid, rather than continuous energy consumption which is met by their microgrid. Customers would have access to the grid during times when the microgrid is offline (e.g., during maintenance or unexpected outages), or when additional load is needed beyond the microgrid's capacity. Considerations in designing the pilot – and subsequently evaluating for full deployment – may include number and size of candidate microgrids, system export capabilities, and planned system operations.

By providing a clear tariff structure under which to operate and signaling support for these systems, the Microgrid Standby Tariff mitigates financial and policy barriers for customers interested in microgrid deployment while ensuring reliability and fairness for all grid users.

Microgrid Standby Tariff	
Portfolio & Initiative	Activating the Local Energy Ecosystem – Interconnection Solutions
Program Summary	• Update and deploy standby rate for customers served by a microgrid under normal conditions that still rely on the grid for backup power or other services
Target Market & Stakeholders	• All customers served by a microgrid
Regulatory Framework & Utility Precedent	• PG&E Behind-the-Meter Microgrids Tariff (E-BTMM)[58] • Hawaiian Electric Microgrid Services Tariff[59]
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2032: 100% of residents live within walking distance of a facility offering clean backup power during outages (Sustainable DC) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Affordability:** Reduce energy burden

[58] PG&E E-BTMM
[59] Hawaiian Electric Microgrid Services Tariff

	• **Equity:** Increase access to infrastructure, services, and resources • **Interactivity:** Integrate smart devices and data
Related Programs	• Battery Incentives • Virtual Power Plant

DER Upgrades
Customer Incentives

The suite of programs in the **DER Upgrades** initiative are designed to accelerate the customer-driven adoption and interconnection of DERs through financial drivers. In the 5-Year Plan, expansion of behind-the-meter battery energy storage systems (BESS) is prioritized to expand immediate customer benefits in accordance with Pepco's Guiding Principles. Despite their benefits, batteries present high initial investment and uncertainty in their usefulness to customers. **DER Upgrades** programs reduce upfront cost and offer revenue generation opportunities to bolster the business case of batteries and paired distributed generation for customers. Pepco envisions that **DER Upgrades** programs will be expanded in future planning periods to provide customers with additional options for system use cases and potential revenue streams.

5.3.6 Battery Incentives

As electrification and distributed generation (e.g., solar) adoption accelerates in the District, behind-the-meter BESS are an increasingly important asset to grid operations. Battery systems located at customer residences and facilities enable behind-the-meter load management including peak shaving (savings against peak pricing) and flexible EV charging (if applicable), provide flexible and clean backup power, and enable increased utilization of local generation assets. BESS can be used to generate revenue and bill credits via participation in a variety of utility programs as they are introduced in the 5- and 10-Year planning periods. Meanwhile, the grid at large benefits from peak demand reduction and renewable energy supply enabled by BESS deployments.

To address high capital costs and encourage early adoption of BESS by customers, Pepco would offer financial incentives paid to residential and commercial customers to offset installation costs. In the 5-Year Plan period, Pepco would also establish an approved BESS equipment list that would adhere to safety standards and regulatory requirements; evaluate incentives structures, such as rebates, financing, or leasing to customers; and define cost categories eligible for incentives, which may include battery systems, inverters, installation labor, etc. Based on these assessments, Pepco would make the incentives available under the 5-Year Plan.

The program would support Pepco's rollout of BESS-oriented bring-your-own-device programs (see **Virtual Power Plant** program) which provide pay-for-performance bill credits for participation in Pepco DR events via existing customer battery systems.

Battery Incentives	
Portfolio & Initiative	Activating the Local Energy Ecosystem – DER Upgrades
Program Summary	• Incentives for purchase and installation of qualifying Customer-hosted behind-the-meter BESS • Pepco will evaluate incentive structure (e.g., rebate, financing, lease, etc.), approved equipment and manufacturers, and eligible costs to define structure
Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1166 Storage and DER Framework • Eversource Energy Storage Solutions[60]
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Affordability:** Deliver customer compensation • **Affordability:** Reduce energy burden • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability:** Integrate clean energy
Related Programs	• Virtual Power Plant program • TOU Rates

5.3.7 Virtual Power Plant

To leverage accelerating customer DER adoption to strengthen grid-wide operations and interactivity, Pepco will design and propose a **Virtual Power Plant** (VPP) program. A VPP virtually aggregates and manages the capacities of smart grid resources such as storage to ensure resource adequacy. The VPP program in the 5-Year Plan would focus on customers hosting behind-the-meter BESSs, allowing them to opt-in to participate in the VPP program. Pepco would signal participant batteries to dispatch power to the grid during select periods to meet peak demand. Pepco will evaluate and consider several compensation structures, with the goal of allowing customers to generate revenue from their batteries to improve return on investment and incentivize adoption. When not participating in a VPP event, batteries would remain available to their hosts to enhance management of customers' behind-the-meter load and enhance resilience and outage avoidance.

Program design would establish maximum limits on the number of days and hours during which Pepco can dispatch the batteries under a VPP event. As the program matures, Pepco would evaluate integration of additional power sources such as solar, EVs, and

[60] Connecticut Energy Storage Solutions

demand reduction into the program. Additionally, other grid services may be explored as the program matures, including increased hosting capacity or distribution capacity investment deferral.

Virtual Power Plant	
Portfolio & Initiative	Activating the Local Energy Ecosystem – DER Upgrades
Program Summary	• Establish Pepco control platform to aggregate, manage, and discharge customer-hosted behind-the-meter BESS • Establish pay for performance incentives and enroll BYOD participants for VPP events • Expand managed asset types and VPP grid services in 10YP
Target Market & Stakeholders	• Residential customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1166 Storage and DER Framework • Formal Case No. 1130 PowerPath DC • Delmarva Power Elk Neck, MD VPP Pilot[61] • National Grid Connected Solutions Battery program[62], for Residential and Commercial & Industrial
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Affordability:** Deliver customer compensation • **Equity:** Distribute benefits across communities • **Reliability** Contribute to resource adequacy • **Interactivity:** Expand grid visibility and management • **Sustainability:** Integrate clean energy
Related Programs	• Battery Incentives

[61] Maryland PSC Energy Storage Pilot program Interim Report, July 2024
[62] Connected Solutions Battery program

5.4 Enhancing Infrastructure for Climate Solutions

5-Year Plan

This portfolio focuses on preparing Pepco's grid and infrastructure for the utility of the future. Complementary to customer-focused tools and solutions developed through other portfolios, the **Enhancing Infrastructure for Climate Solutions** outline large-scale and foundational decarbonization programs at the core of advanced energy service in the District. Pepco's vision for a sustainable, interactive grid is essential to facilitating the interconnection and operation of DERs, new flexible technologies, and electrified transportation and buildings. The programs proposed in portfolio will help Pepco operate a grid that is stronger, smarter, and cleaner. The 5-Year Plan includes two initiatives:

Power Service Solutions: Wholesale procurement of renewable energy to deliver adequate, reliable, affordable, and increasingly clean supply for sustainable service to all customers and their diverse electrified end-uses. Identify, vet, and execute novel contract methods to balance affordability and cost certainty. This initiative is central to achieving the emissions-reduction potential of electrification by powering new transit and building loads with lower-carbon energy.

Infrastructure Upgrades: Plan high-impact distribution system upgrades to expand grid capability and capacity to manage loads and maintain resource adequacy. Leveraging both software and hardware upgrades, this grid-wide initiative enables bi-directional control of new technologies to equitably meet demand, sense and smooth grid operations, and maintain reliable, responsive service. While infrastructure upgrades often represent significant investment, planning efforts can improve affordability by targeting efforts where they deliver the greatest benefit to the most customers.

Efforts under the 5-Year Plan aims to alleviate near-term bottlenecks and provide modernized grid functionality to set the stage for well-coordinated, impactful distribution planning in future planning periods.

Power Service Solutions
Pepco Programming

Beyond transmission and distribution, Pepco is responsible for procuring and delivering an adequate and reliable supply of power to its customers. In the District, electricity consumption is responsible for 46% – almost half – of GHG emissions.[63] As such, the electricity supply provided by Pepco presents enormous potential to affect decarbonization and advance local policy goals. This initiative presents strategies to leverage Pepco's outsize role to cost-effectively and responsibility increase the renewable mix available to the majority of customers at scale.

5.4.1 Expanded Green Rider

Approximately 85% of District customers receive Standard Offer Service, or SOS, which is power purchased and delivered by Pepco. The remainder of customers receive power from unregulated third-party suppliers. As the SOS Administrator, Pepco is responsible for competitive wholesale procurement of 100% of the SOS load. This includes procurement necessary to meet the District's RPS, which increases each year as a percentage of total supply until 2032, when 100% of supply must be procured from renewable resources such as solar, wind, and other resources identified as tier one resources in DC's RPS law.[64]

Pepco's **Expanded Green Rider** provides an option for customers who wish to procure 100% renewable energy before the SOS mix reaches 100% renewable in 2032. This would give customers the opportunity to directly support renewable and clean energy in the District. Under this program, SOS customers would be able to opt-in to pay a surcharge on their SOS rates to procure 100% renewable energy via Pepco. The surcharge would vary as the renewables mix in SOS supply grows over time. The existing rider is currently only available to residential customers who own EVs enrolled in whole house TOU rates. Under this program, Pepco would expand Green Rider eligibility to all residential SOS customers and potentially commercial SOS customers. The Rider would allow Pepco customers to play a greater role in accelerating renewable energy supply in the District, reduce their carbon footprint, and support the clean energy market at-scale, without requiring upfront investment. The **Expanded Green Rider** will sunset in 2032 upon achievement of the 100% RPS.

[63] DOEE Greenhouse Gas Inventories
[64] 34 DC Code 1431; 34 DC Code 1432

Expanded Green Rider	
Portfolio & Initiative	Enhancing Infrastructure for Climate Solutions – Supply Solutions
Program Summary	• Enable all SOS customers to opt-in to pay a surcharge for 100% renewable energy via Pepco-purchased renewable energy certificates (RECs) • Surcharge varies based on percentage of renewables in SOS, sunsets 2032
Target Market & Stakeholders	• All SOS customers
Regulatory Framework & Utility Precedent	• Dominion Energy Virginia, Green Power[65] • Puget Sound Energy Green Power[66] • Xcel Renewable*Connect Flex[67]
District Goal Alignment	• 2030: 60% reduction in GHG emissions (CCA22) • 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Affordability:** Promote third-party investment • **Sustainability:** Integrate clean energy
Related Programs	• Rate Solutions

[65] Dominion Energy Virginia, Green Power
[66] PSE Green Power
[67] Xcel Energy Renewable*Connect

Infrastructure Upgrades
System Investment

System investment provided by Pepco in this initiative is fundamental to scaling climate solutions and customer-oriented programs while maintaining core reliability. The Company's investments in distribution system infrastructure and capabilities are foundational to create an interactive grid for customers, DER developers, and electrified end-users alike. The interactive grid will provide for enhanced planning, dispatch, and operational capabilities. In promoting interactivity and enhanced management of the system, **Infrastructure Upgrades** programs result in an interconnected grid that is better able to flexibly accommodate electric devices of all kinds and optimize their use for the evolving challenges of a more dynamic grid.

5.4.2 Distributed Energy Resource Management System

Operating the distribution system with increasing penetration of renewables, DERs, and interactive grid elements requires an increasingly smart and sensing grid to ensure safe and reliable operation.

As part of a multi-stage Pepco-wide effort, the deployment of **Distributed Energy Resource Management System** (DERMS) will be a foundational component of a modernized grid. The software-based technology platform enables visibility to integrated DERs across the District. DERMS will connect with DER-paired smart inverters installed within the District to coordinate their power supply to the grid. DERMS will connect with DER-paired smart inverters installed within the District to coordinate their power supply to the grid. DERMS will also provide capabilities for real-time generation forecasting and production monitoring to inform dispatch of DERs via smart inverters, flexing power supply to match demand and maintain resource adequacy. The advanced capability provided through DERMS will enable future opportunities envisioned in later stages of the 15-Year Plan, such as V2G programs.

Distributed Energy Resource Management Systems	
Portfolio & Initiative	Enhancing Infrastructure for Climate Solutions – Infrastructure Upgrades
Program Summary	• Deployment of DERMS software platform to support grid-wide monitoring, control, management, and integration of distributed local energy generation and storage assets
Target Market & Stakeholders	• All customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1130 PowerPath DC
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act)

	• 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Equity:** Distribute benefits across communities • **Interactivity:** Expand grid visibility and management • **Sustainability:** Integrate clean energy
Related Programs	• Interconnection Solutions • DER Upgrades

5.4.3 Integrated Distribution System Planning & Forecasting

Stemming from the broader PowerPath DC initiative established under Formal Case No. 1130, the Commission opened Formal Case No. 1182 in early 2025 to collect comments on IDSP requirements. While still in its nascent stages, it is expected that the IDSP requirements will promote a transparent, data-driven, and customer-focused approach by Pepco to grid planning and investments in modernizing the electric system. In addition to traditional distribution planning, IDSP emphasizes advanced technologies, data analytics, and DERs to meet demands and District climate commitments, including electrification and resultant load increases. As the Commission continues to review stakeholder comments in summer 2025 and prepares to convene the IDSP Working Group, Pepco anticipates further guidance on the IDSP process and looks forward to engaging with the IDSP Working Group and the next steps of this docket after the Working Group concludes in Spring 2026. By their nature, there is expected to be significant interplay between the programs under this portfolio and Pepco's IDSP efforts. Pepco will coordinate planning, filing, and execution efforts across Climate Solutions Plan and IDSP efforts to advance grid modernization and decarbonization actions in tandem. This program acknowledges Pepco's parallel IDSP work in the near-term, and anticipates that additional IDSP-identified projects and programs will be incorporated in greater detail in the future planning horizons and Climate Solution Plan 15-Year Plan updates.

IDSP Planning & Forecasting	
Portfolio & Initiative	Enhancing Infrastructure for Climate Solutions – Infrastructure Upgrades
Program Summary	• Initiating IDSP processes in accordance with forthcoming Commission directives • Coordination of Climate Solutions Plan programs with IDSP process and projects for comprehensive planning
Target Market & Stakeholders	• All customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1130 PowerPath DC • Formal Case No. 1182 IDSP
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)

Customer Value	• **Equity:** Distribute benefits across communities • **Reliability** Contribute to resource adequacy
Related Programs	• EV Make-Ready Upgrades • Building Upgrades • Interconnection Solutions • DER Upgrades • Power Service Solutions • Infrastructure Upgrades

5.4.4 Billing Automation

Under Pepco's current billing system, accommodating any potential future changes to DER interconnection fees, such as new billing regulations, standards, or requirements, would require that all transactions, tracking, and reporting be done manually. This would result in billing delays and errors, potentially leading to interconnection delays. IT investments in Pepco's billing system would allow the company to process bills automatically, expediting bill timeliness and reducing manual handoffs. This would improve accuracy and reduce billing errors, streamlining the interconnection process.

Pepco's Progress and Percent Billing Automation Project would deliver a fully automated payment feature for pre-application, solar application, and hosting capacity fees access through Pepco's developer portal, as well as enhanced back-office capabilities that would streamline Pepco's project invoicing and payment systems and processes. These improvements would result in improved application timelines, as well as a better overall user experience for developers. This program is designed as a one-time upgrade of Pepco's billing system and would not continue past the 5-Year Plan.

Billing Automation	
Portfolio & Initiative	Enhancing Infrastructure for Climate Solutions – Infrastructure Upgrades
Program Summary	• Upgrades include fully automated payment feature for pre-application, solar application, and hosting capacity fees access through Pepco's developer portal.
Target Market & Stakeholders	• DER developers
Regulatory Framework & Utility Precedent	• RM81 – Maryland Cost Allocation Methodology[68]
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Affordability:** Promote third-party investment

[68] RM81 – Small Generator Facility Interconnection Revisions to COMAR 20.50

	• **Equity:** Increase access to infrastructure, services, and resources • **Reliability** Contribute to resource adequacy • **Sustainability:** Integrate clean energy
Related Programs	• N/A

5.4.5 Radial Hosting Capacity Improvement Siting

As DERs increasingly tie into the distribution system investments will be needed to ensure continued safe and reliable service. Under current regulatory processes, customers wishing to interconnect can be responsible for the cost of necessary system improvements needed to maintain service quality and technical requirements of the distribution system. This added cost can present a significant barrier to new DERs. Under this program, Pepco would initiate proactive identification and evaluation of interconnection constraints on the radial distribution system. This would allow Pepco to site and plan necessary hosting capacity improvements to address existing bottlenecks that would otherwise prevent customer interconnections. This complements the **DER Hosting Capacity Maps**, which highlights existing capacity for interconnections, by identifying portions of the radial distribution system which require system investment by Pepco to accommodate future DERs.

Pepco has previously invested in software to model high volumes of DER saturation scenarios on the radial distribution system which identifies limiting factors and potential violations of power quality and equipment capabilities under current conditions. Leveraging this data and other considerations such as localized load profiles, Pepco would identify priority locations for improvements to facilitate DER interconnection. As this information is incorporated into Company planning documents, it can inform customer and developer development efforts.

In later planning horizons, Pepco would be equipped to engineer and execute targeted hosting capacity improvements at priority sites to deliver impactful system upgrades that promote resource adequacy and DER deployment in line with the Company's Guiding Principles.

Radial Hosting Capacity Improvement Siting	
Portfolio & Initiative	Enhancing Infrastructure for Climate Solutions – Infrastructure Upgrades
Program Summary	• Identify priority radial distribution system locations requiring Pepco improvements to avoid DER-induced bottlenecks, enhance hosting capacity, and facilitate customer DER interconnection • Incorporate into capital plans, 10- and 15-Year Plans, and IDSP

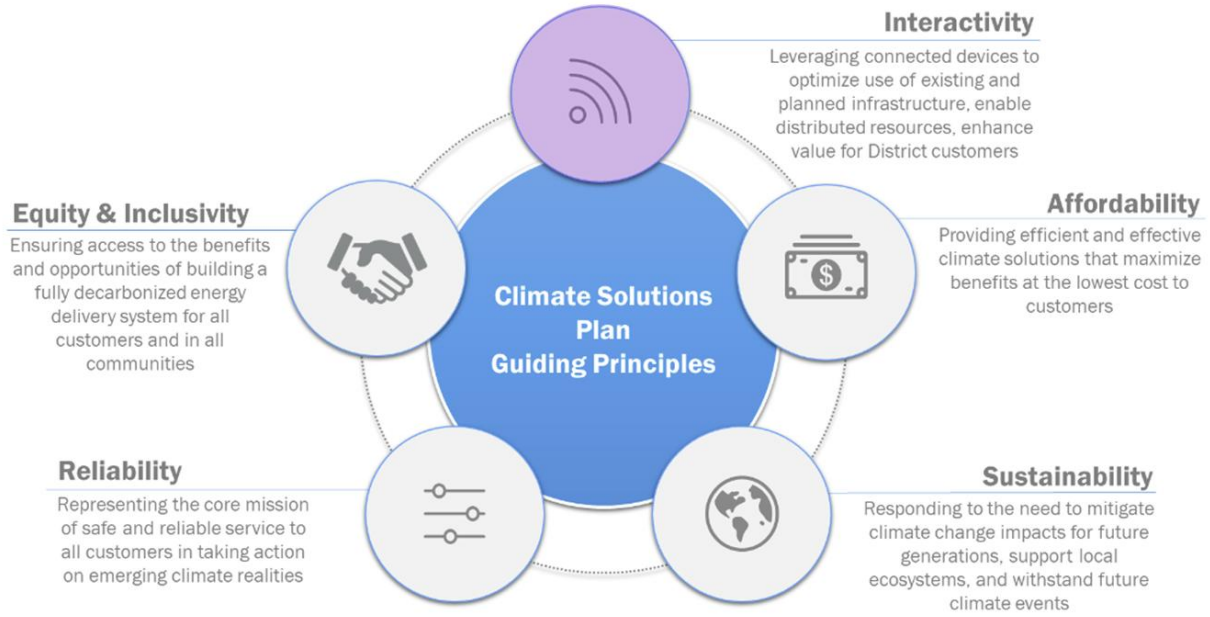
Target Market & Stakeholders	• All customers interested in interconnecting to the radial distribution system • Third-party developers
Regulatory Framework & Utility Precedent	• Formal Case No. 1130 PowerPath DC
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Equity:** Distribute benefits across communities • **Reliability** Contribute to resource adequacy • **Sustainability:** Integrate clean energy
Related Programs	• Integrated Distribution System Planning & Forecasting

6 Climate Solutions 10-Year Plan

Pepco's 10-Year Plan identifies strategies the Company can advance between 2031 and 2035 to support the District's 2035 target for 100% renewable energy supply and 2045 goal of carbon-neutrality, as well as various interim District and Company goals. The 10-Year Plan assumes steady progress is achieved towards these goals and preceding policy targets through 2030 – such as increasing ZEV registrations, NZE building standards, emissions reductions, and growth in local renewables – and has considered the resulting dynamics in its development.

Specifically, as renewables penetration increases and customer electrification accelerates, the distribution system will be subject to load growth, evolving peak periods, and mismatched production curves. Effective demand-side management and load shifting will be essential to integrate DERs and grid-connected technologies while maintaining reliable service for all customers. In contrast, peak reduction through efficiency will be deprioritized, as BEPS become standard practice and grid power shifts away from fossil fuels, reducing impact of these programs for most customers.

In light of these factors and the Climate Solutions Plan Guiding Principles, the 10-Year Plan proposes continuation of key programs from the 5-Year Plan and phases out others no longer suited to the anticipated market. The 10-Year Plan also introduces new strategies specifically suited to the Climate Solutions Plan Guiding Principle of **interactivity**. Pepco's 10-Year Plan builds on the foundation of reliable and equitable service established in the 5-Year Plan by targeting investment in climate-aligned solutions and broadening the Company's role as a platform for customer participation, DER integration, and resource distribution throughout the District. Importantly, targeted LMI programs continue through the 10-Year Plan to underpin equity and affordability and ensure the energy transition is accessible to all customers.



Where the 5-Year Plan seeks to spur grid-edge technologies and third-party investment, the 10-Year Plan is aimed at leveraging these interactive assets to reliably, flexibly, and equitably manage an increasingly renewable and decentralized power supply as loads grow. As more customers deploy grid-connected resources such as batteries, EVs, and smart appliances as enabled in the 5-Year Plan, the ability to effectively coordinate and integrate those assets becomes essential to keeping affordability front and center and maintaining reliable and equitable service. Interactivity allows the grid to be more dynamic and responsive, shifting from one-way energy delivery to a two-way exchange of increasingly decarbonized resources between Pepco and its customers. This shift is critical for unlocking the full potential of DERs and building a resilient energy ecosystem that adapts to customer behavior, technological trends, and climate impacts. Through this lens, every program outlined in the 10-Year Plan is designed not only to reduce emissions or expand DER capacity, but to empower all customers to interact with the grid in new and meaningful ways.

Programs identified in the 10-Year Plan will ultimately be informed by learnings from the 5-Year Plan, by emerging market, policy, and technology trends, and by external market factors and conditions. The 10-Year Plan details new potential programs which Pepco may implement under each portfolio throughout the 10-Year Plan, separated by portfolio and initiative. Each portfolio also identifies those programs which may be maintained and modified from the 5-Year Plan. In all portfolios, programs continued from the 5-Year Plan remain subject to re-evaluation in consideration of BCA, affordability, and program impact.

While this 10-Year Plan is designed with the expectation of increased uptake of new technologies and solutions, Pepco recognizes that this plan must remain nimble to be able to react to external factors that are currently unknown, such as technology maturation (or lack thereof), inflation, loss of funding or other policy changes, supply chain constraints, etc. As such, programs may need to shift from one timescale to another, especially if they are dependent on the success of other programs proposed in this plan. Pepco appreciates the iterative nature of a three-year update cycle for its Climate Solutions Plan as an opportunity to continually evaluate program success, the various factors affecting program implementation, and how plans for future programs should change.

6.1. Electrifying Transportation

10-Year Plan

Initiatives in Pepco's 10-Year Plan seek to grow interactive capability between the distribution system and grid-edge technologies to expand DER utilization, peak shaving, and load shifting to maintain resource adequacy:

EV Rate Solutions: Provide rate structures that enable and encourage customers to utilize EVs interactively to supply power back to the grid for enhanced resource adequacy. Promote leading V2G technology through clear rate policy support and favorable economics via direct compensation.

EV Make-Ready Upgrades: Deploy enabling infrastructure to unlock use of EVs as grid-edge DERs capable of managing system demand, enhancing local solar utilization, and supplying power to support grid-wide loads. Facilitate customer-level system upgrades that distribute benefits of grid-connected technologies across the District.

The 10-Year Plan identifies targeted new programs aimed at advancing the Company's vision of an interactive grid. Pepco also anticipates continuing a number of programs identified in the 5-Year Plan, with potential updates as appropriate to reflect growing customer trends, market adoption, operations and performance data, and stakeholder feedback:

- **Managed Charging:** Maintain program as identified in 5-Year Plan, with refined design elements (e.g., bill credit values, target participation rate and events, off-peak window) based on Smart Charger data.
- **EV TOU:** Maintain residential program as included in 5-Year Plan, with refined design elements such as usage rates and TOU windows, based on Smart Charger data. Pilot expansion to commercial fleet charging.
- **DCFC Rate Solution:** Following rate solution design under the 5-Year Plan, this program is intended to be deployed in the 10-Year Plan to facilitate DCFC. Under current assumptions of expected EV deployment and DCFC utilization, this program is expected to phase out by the end of the 10-Year Plan Period as EV prevalence increases and DCFC utilization increases, negating the need for a DCFC demand charge solution.
- **Transit Bus Rate Solutions:** Based on findings of rate structure study and design in 5-Year Plan, implement rate solution and refine over time with Smart Charger data.
- **Residential, Destination, and Fleet & Taxi Charging:** Continue the program as introduced in the 5-Year Plan, with rebate incentives reoriented towards necessary upgrades for bi-directional V2G capability for eligible applications and customers. Program funding may be allocated increasingly towards medium- and heavy-duty EVs to accelerate the energy transition and scale program impact.

EV Rate Solutions
Pepco Programming: 10-Year Plan

6.1.1 Vehicle-to-Grid Compensation

As EV prevalence increases over the 10-Year Plan period, two-way power flow from these grid-connected assets can support distribution system operations, renewables integration, and overall resource adequacy. Similar to distributed traditional BESS, EV onboard batteries can be discharged to provide backup power, enable demand-side management, store and use excess renewables, or support grid peak shaving. EV owners with appropriate configurations can leverage their vehicles to directly benefit through enhanced resilience and reduced energy burden. To encourage customers to use their EVs to support the grid through these use cases, the Company will develop a pilot **Vehicle-to-Grid (V2G) Compensation** program to incentivize residential EV owners to dispatch power to the grid in scheduled periods of peak demand, distributing the reliability and renewables benefits of personal vehicles grid-wide.

The pilot would be available to both residential and commercial EV owners with registered bi-directional chargers. The pilot would outline a V2G schedule corresponding to peak periods when the grid is most in need of supplemental capacity to meet demand. As renewable penetration increases in the District, peak periods are expected to shift towards evening, aligning well with the time of day when residents are home and EVs may be plugged into residential chargers and capable of dispatch – but not yet charging in low TOU windows later in the night. As a result, V2G compensation becomes an increasingly effective mechanism in the 10-Year Plan and beyond.

Participating customers would receive “pay-for-performance” compensation in the form of bill credits for each kilowatt-hour supplied from their EV to the grid via their registered bi-directional charger. Similar to scheduled charging, customers would be able to participate in V2G during the set windows on a regular basis, electing to discharge a certain capacity over a given period based on their charging and use needs. Alternatively, they would be able to participate on a one-off basis, within the program defined V2G periods. In addition to promoting resource adequacy, the compensation provided by the program would continue to support the economic case for EV ownership and charging infrastructure upgrades. Further, the program would offer an avenue for excess co-located solar production to be utilized and sold, encouraging ongoing renewables development.

Pepco will also evaluate opportunities to negotiate special rates with public and commercial fleets to capitalize on their combined scale and mandated EV goals, especially those operating medium- and heavy-duty EVs. If pursued, custom rate pilots for these customers may consider the potential to use V2G dispatch to strategically alleviate distribution system constraints based on fleet host site locations.

The pilot – including bill credit rates, V2G schedule, and custom fleet strategies – may be refined over time based on Smart Charger data and program performance. This program complements **Virtual Power Plant** programming, which proposes to expand to incorporate event-based V2G in the 10-Year Plan period.

Vehicle-to-Grid Compensation	
Portfolio & Initiative	Electrifying Transportation – EV Rate Solutions
Program Summary	• V2G pilot providing pay-for-performance compensation to customers that send power from their EVs to the grid during scheduled periods
Target Market & Stakeholders	• Residential customers • Commercial customers • Public and commercial fleets
Regulatory Framework & Utility Precedent	• National Grid Massachusetts Connected Solutions Battery Program[69] • National Grid Upstate New York Value of Distributed Energy Resources (VDER) Program[70] • Pepco Maryland Proposed Distribution System Support Services Pilots and Time-of-Use Tariffs filing under the DRIVE Act[71]
District Goal Alignment	• 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022) • 2045: Achieve carbon neutrality (CCA22)
Customer Value	• **Affordability:** Deliver customer compensation • **Affordability:** Promote third-party investment • **Equity:** Distribute benefits across communities • **Reliability:** Manage peak load • **Reliability** Contribute to resource adequacy • **Sustainability:** Integrate clean energy
Related Programs	• Virtual Power Plant • Vehicle-to-Grid Deployment

[69] National Grid Massachusetts Battery Program
[70] National Grid Upstate New York VDER, July 2025
[71] Case No. 9761, Filing No. 40

EV Make-Ready Upgrades
Customer Incentives: 10-Year Plan

6.1.2 Vehicle-to-Grid Deployment

The **Vehicle-to-Grid Deployment** program would promote interactivity in the 10-Year Plan period by reducing barriers to adoption for V2G participation. Unlike traditional grid-to-vehicle charging, bi-directional V2G requires an interconnection to supply power back to the distribution system. As a result, V2G capability presents upfront costs associated with interconnection as well as any additional upgrades to enable safe interconnection or increase service capacity, especially at the District's many older facilities. While the most critical component of a V2G charging station – a bi-directional charger – is currently commercially available, it is significantly more costly than a standard Level 2 charger. Though costs are expected to decline over time as EVs gain more popularity, these additional required investments can present an obstacle to customers that may otherwise be interested in supplying power to the grid from their EVs.

Pepco can help to address these obstacles and encourage V2G participation by offering make-ready rebate incentives for upgrades required to enable interconnection of grid-interactive chargers. The rebate eligibility of bi-directional chargers will be evaluated under program design. Rebates would be right sized in consideration of LMI status, planned application, customer class, location, and potential benefit to the grid from the grid-connected asset. For example, residential charger interconnections are typically less costly and integrate light-duty EVs with smaller potential power supply to the grid; meanwhile, commercial fleets or heavy-duty vehicles may require more costly upgrades but may offer grid benefit at greater scale. As a result, the program would provide an appropriate level of support to individual customers and share increased benefits of V2G – including resource adequacy, reliability, and renewables integration – District-wide.

As with programs proposed under the 5-Year Plan, chargers installed with the support of the program would be required to have "smart" data sharing capabilities. Participants receiving incentives under the program would be required to opt-in to either the **Virtual Power Plant** program or some minimum scheduled participation under **Vehicle-to-Grid Compensation**, pending Commission approval of such programs.

Vehicle-to-Grid Deployment	
Portfolio & Initiative	Electrifying Transportation – EV Make-Ready Upgrades
Program Summary	• Rebates for make-ready interconnection upgrades at residential and commercial properties to support new V2G • Increased incentives for upgrades in LMI communities and with greater EV capacity

	• Requires participation in V2G via VPP or V2G Compensation minimum scheduling
Target Market & Stakeholders	• Residential customers • Commercial customers • Public and commercial fleets
Regulatory Framework & Utility Precedent	• PG&E V2X Residential, V2X Commercial[72] • Con Edison New York V2G bus pilot[73]
District Goal Alignment	• 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022) • 2045: Achieve carbon neutrality (CCA22)
Customer Value	• **Affordability:** Promote third-party investment • **Equity:** Increase access to infrastructure, services, and resources • **Equity:** Distribute benefits across communities • **Interactivity:** Integrate smart devices and data • **Interactivity:** Expand grid visibility and management • **Sustainability:** Integrate clean energy
Related Programs	• Vehicle-to-Grid Compensation • Virtual Power Plant

6.1.3 Bundled Level 2 Charging & DERs

In addition to make-ready upgrades, many utilities in the region and nationwide offer customers rebates for qualifying Level 2 EV chargers. It is expected that EV charging infrastructure costs will decrease over the 10-Year Plan period, while customer adoption grows. As such, rebates for EV charging may become less impactful in driving electrification. This program is envisioned as the next iteration of EV charging incentives to advance complementary District goals such as renewables standards and resource adequacy while managing EV impacts to peak demand on the grid.

This program would offer Level 2 Smart charger rebates to customers that install some minimum capacity DER on their property. The rebates would work to incentivize paired generation and EV, enabling customers to use their vehicle's battery for energy storage to reduce DER curtailment, manage utility costs associate with charger, and potentially benefit from backup power. Co-located DERs promote EV charging from third party-owned energy generation, reducing demand on the grid and increasing renewables penetration in the District. For customers installing DERs, the program will reduce upfront costs for DER-paired EV charging, making the economic case for both DER installation and EV conversion more appealing. Similar to traditional EV rebates, participating

[72] PG&E Vehicle-to-Everything (V2X) pilot program
[73] Con Edison Findings from E-School Bus Project

customers will would be required to provide system documentation including interconnection approval and relevant permits and installer licenses.

By incentivizing DERs and addressing broader, evolving District energy needs while "raising the bar" for charger rebate eligibility, the program can increase cost-effectiveness and affordability of EV charger rebates.

Bundled Level 2 Charging & DERs	
Portfolio & Initiative	Electrifying Transportation – EV Make-Ready Upgrades
Program Summary	• Rebates for Level 2 Smart charger available to customers installing DERs on their property • Increased rebate available for LMI or small business customers
Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• Pepco DC and Pepco Maryland Electric Vehicle Program Level 2 charger rebate[74] • Dominion Energy Virginia EV Charger Rewards Level 2 charger rebate[75]
District Goal Alignment	• 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022) • 2045: Achieve carbon neutrality (CCA22)
Customer Value	• **Affordability:** Deliver customer compensation • **Affordability:** Reduce energy burden • **Affordability:** Promote third-party investment • **Reliability:** Manage peak load • **Reliability** Contribute to resource adequacy • **Interactivity:** Integrate smart devices and data • **Sustainability:** Integrate clean energy • **Sustainability:** Enable electrification
Related Programs	• EV Make-Ready Upgrades

[74] Pepco Electric Vehicle Program
[75] Dominion Energy Virginia EV Charger Rewards

6.2 Decarbonizing Buildings

10-Year Plan

In the 10-Year Plan, Pepco plans to introduce several new programs under each initiative to promote deeper electrification and resource adequacy through demand-side management. These efforts will include innovative strategies to encourage customers to shift electricity usage to off-peak hours, helping to maintain grid reliability as electrification expands and demand grows.

Building Rate Solutions: Expand managed devices and applications within DR programming, providing additional means and incentives for customers to decrease usage during peak events. Rate solutions provide a framework and financial motivator for customers to align behavior with system needs as buildings continue to electrify and demands on the grid evolve. These programs can help manage grid stressors, enhance reliability, and reduce overall system costs while promoting affordability for participating customers.

Behavioral & Technical Solutions: As front-line, early engagement programs are implemented throughout the 5-Year Plan, this initiative will re-focus on high-impact customers, lighter-touch support, and AMI-enabled data-driven programs for cost effectiveness. Various audit programs will be streamlined into a single comprehensive program exclusively serving LMI and small business customers. These programs continue to introduce customers to additional solutions available from Pepco and District stakeholders, guiding them toward deeper energy upgrade opportunities, greater long-term savings, and accelerated Pepco program impact.

Building Upgrades: Offer financial incentives for select energy system upgrades with innovative solutions to help customers electrify. By offsetting upfront costs through targeted rebates, these programs are designed to increase access to, and accelerate customer adoption of, electrified appliances and innovative energy management technologies to reduce overall emissions while managing building loads on a permanent basis.

While the 10-Year Plan introduces new programs within this portfolio, it proposes to maintain select programs established in the 5-Year Plan. Below is a list of those identified programs expected to remain relevant in the 10-Year Plan period, along with brief updates on any anticipated changes or adjustments.

- **Residential TOU Rate Expansion:** Maintain rate as outlined in the 5-Year Plan and according to outcomes of Rate Design Working Group. Refine based on customer use patterns as established through billing data.
- **Commercial TOU Rate**: Maintain rates as outlined in the 5-Year Plan and according to outcomes of Rate Design Working Group. Refine based on customer use patterns as established through billing data.

- **Thermostat-Based DR:** Consolidate program as identified under 5-Year Plan period into the new **Demand Side Management** program (see Section 6.2.3 below).
- **Direct Load Control:** Maintain program as outlined in the 5-Year Plan. Explore potential to expand to commercial customers and other appliances/equipment other than air conditioners.
- **Schools and Education:** Maintain program as outlined in the 5-Year Plan, with refined curriculum based on feedback.
- **Customer Portal:** Maintain program as identified in the 5-Year Plan, with refined metrics, dashboard view and services as requested through user experience surveys.
- **No-Cost Home Energy Reports:** Maintain program as included in the 5-Year Plan, with refined metrics, delivery and solutions based on customer feedback.
- **Electrification Make-Ready:** Maintain program as outlined in the 5-Year Plan, with a refined incentive structure based on program and upgrade cost data.
- **Commercial Prescriptive & Custom Incentives:** Rescope incentives to exclusively cover measures that advance electrification.
- **Residential New Construction & Major Renovations:** Maintain program as included in the 5-Year Plan, integrating smart home technologies as the market evolves, as well as expanded eligibility for heavy-up equipment to support all-electric new and retrofit buildings.

The following programs are new additions Pepco proposes for the 10-Year Plan, building on the successes and lessons learned from the 5-Year Plan programs.

Building Rate Solutions
Pepco Programming: 10-Year Plan

6.2.1 Critical Peak Rebate

As part of Pepco's broader effort to enhance load flexibility and grid reliability, Pepco proposes the **Critical Peak Rebate** program to incentivize customers to voluntarily reduce electricity usage during periods of high system demand, or "peak events."

The opt-in dynamic pricing program would establish a critical peak rebate to residential and commercial customers who reduce overall usage during these periods. The Company would provide advanced notice to customers about impending critical peak periods. Customers that reduce their consumption below a defined baseline level during an event would receive a rebate on their electricity consumption. Baseline energy targets would be set and published for customers in accordance with their typical usage. Rebates would be provided on an event-by-event participation basis, rather than degree of reduction achieved.

This program complements passive **Residential TOU** demand side management programs as well as device-based active management DR programs, providing another "tool in the toolbox" to maintain resource adequacy as peak periods evolve in the 10-Year Plan horizon. This program is designed to positively influence customer behavior in critical periods to reduce loads without penalizing customers that cannot participate. It also expands DR participation eligibility to customers without smart devices, though AMI would be required.

Critical Peak Rebate	
Portfolio & Initiative	Decarbonizing Buildings – Rate Solutions
Program Summary	• Establish an opt-in critical peak rebate (CPR) for customers with AMI • Provides reduced cost for decreased usage below target during "peak events"
Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• Pepco MD Peak Energy Savings Credit[76] • BGE Peak Rewards[77]
District Goal Alignment	• 2032: Reduce energy use by 50% (CEDC Act)

[76] Pepco MD Peak Energy Savings Credit
[77] BGE Peak Rewards

Customer Value	• **Affordability:** Deliver customer compensation • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability**: Encourage efficiency
Related Programs	• TOU Rates • Demand Response Programs

6.2.2 All Electric Rate

Pepco will explore the reintroduction of an **All Electric Residential Rate** (R-AE) Schedule. This rate is intended to support customers in the transition away from fossil fuels and provide a specialized rate structure that incentivizes the adoption of all-electric appliances and systems. Pepco's all-electric rate solution would seek to encourage customers to install electric heating, water heating, and cooking systems in place of gas-powered alternatives specifically, in mixed fuel buildings.

The primary objective in the 10-Year Plan period is to assess whether a targeted electric rate solution can serve as a meaningful short-term incentive for electrification, while still providing appropriate cost recovery District-wide. Anticipated mechanisms in an all-electric rate may include reduced demand charges, alternative demand charge calculation, or reduced consumption rates in consideration of typical load profile for fully electrified buildings. Additional considerations in structure and eligibility may include the presence of DERs and EVs at the customer location. Customers would be required to provide documentation of eligibility based on installed systems at the service location.

Based on the findings of the study, the program may be launched on a short-term basis in the 10-Year Period. It is anticipated that the All Electric Rate would be phased out after the 10-Year Plan period, as full electrification increases in the District, and re-converge with standard rates as part of ongoing rate updates. Given that the program is anticipated to be offered for a limited window in the 10-Year Plan period, the Company proposes to conduct one-time verification of customer eligibility at enrollment. However, in the event that study findings provide a case to maintain the rate longer term, ongoing customer self-verification may be required to confirm continued eligibility for the rate.

All Electric Rate	
Portfolio & Initiative	Decarbonizing Buildings – Rate Solutions
Program Summary	• Conduct a study to investigate the introduction of an R-AE Schedule • Subject to study findings, launch R-AE Schedule for verified eligible customers
Target Market & Stakeholders	• Residential customers • Commercial customers

Regulatory Framework & Utility Precedent	• Potomac Edison All Electric General Service[78]
District Goal Alignment	• 2035: 100% new & replacement electric heat and hot water systems (Carbon Free DC) • 2040: 90% building electrification (Carbon Free DC) • 2045: Carbon neutrality (CCA 22)
Customer Value	• **Affordability:** Reduce energy burden • **Sustainability:** Enable electrification
Related Programs	• N/A

6.2.3 Demand Side Management

The **Demand Side Management** (DSM) program broadens the scope of the **Thermostat-Based DR** program identified in the 5-Year Plan to include additional BYOD applications on a pilot basis. This program is designed to empower customers to leverage their connected devices for load management to play a more active role in grid reliability while minimizing disruptions to their comfort and daily routines. In addition to smart thermostats for heating, ventilation, and air conditioning (HVAC) load management, the pilot will contemplate integration of customer-owned BESS, EV chargers, and water heaters. Additional devices may be identified prior to rollout as "smart home" technology matures. The pilot would help to confirm the most effective devices to integrate into long-term DSM programing, as well as appropriate DR credit structures which may vary by device type.

Integrated devices would temporarily cycle or shift customer loads during DR events initiated by Pepco, with customers able to opt-out of a given event. Participating customers earn performance-based bill credits. By enabling management of more diverse energy-consuming equipment, the program would enhance Pepco's responsiveness to balance demand and supply during peak events, while creating less perceptible impacts to the end user.

Unlike the **Thermostat-based DR** program, rebates for eligible connected devices are not contemplated under this program as incentives are included in other initiatives such as **EV Make-Ready Upgrades**.

Demand Side Management	
Portfolio & Initiative	Decarbonizing Buildings – Rate Solutions
Program Summary	• Expand BYOD DR program to include additional end-uses such as battery storage, EV chargers, & water heaters

[78] Potomac Edison Maryland Tariffs

	• Provides bill credits for temporarily cycling or shifting customer loads when DR events are called and provide active management DR mechanism
Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• BGE Electric Water Heater Program[79] • Delmarva MD Energy Wise Rewards[80] • PSEG FlexPower Program[81]
District Goal Alignment	• 2032: Reduce energy use by 50% (CEDC Act)
Customer Value	• **Affordability:** Deliver customer compensation • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data
Related Programs	• Thermostat Based DR Program • Direct Load Control Program • TOU Rates • Critical Peak Credit

[79] BGE Electric Water Heater Program
[80] Delmarva Energy Wise Rewards
[81] PSEG FlexPower Program

Behavioral & Technical Solutions
Pepco Programming: 10-Year Plan

6.2.4 LMI-Only In-Depth Audit, Direct Install & Incentivized Upgrades

As many efficiency measures become standard practice, and renewables penetration accelerates, opportunities for direct install efficiency upgrades and their impact will decrease. In parallel with growth of a clean and local power supply, electrification will become an increasingly important mechanism to achieve Direct decarbonization goals, though the Company is appreciative of the upfront cost of electrification. In response, the **LMI-Only In-Depth Audit** program would consolidate previously available residential programs into a single, comprehensive audit program designed exclusively for LMI households, with a focus on reducing financial and technical barriers of appliance electrification.

As a way to expand equity in the District, and provide services exclusively to LMI customers, this program would merge the **Quick Home Energy Check-Up**, or QHEC, (Section 5.2.6) with the **Home Performance** (Section 5.2.7) programs outlined in the 5-Year Plan. These programs, introduced under the 5-Year Plan, are unified in the 10-year plan to expand services to LMI customers, taking the unique characteristics of each program into an audit-to-action program. Participating LMI households would receive a no-cost, in-depth home energy audit performed by certified professionals. The audit would identify cost-effective opportunities to improve home energy performance, with specific emphasis on electrification-readiness. Participants would subsequently be directed to resources to implement no- or low-cost electric equipment installations with smart controls or performance-based financing support, as detailed under Section 5.2.9 **Home Performance**. Weatherization would remain included in the program to support load management as HVAC systems are increasingly electrified and winter peaks grow.

The reworked program would simplify the customer experience, reduce participation barriers, and provide targeted support to income-qualified residential customers for transitioning to all-electric homes. It would also provide an avenue for LMI customers to participate in complementary interactive demand-side management programs to further reduce energy burden. The streamlined approach promotes Company cost-effectiveness by focusing investments on those customers which face the greatest ongoing barriers to electrification, especially as building upgrades otherwise accelerate among other customer sectors.

LMI-Only In-Depth Audit	
Portfolio & Initiative	Decarbonizing Buildings – Behavioral & Technical Solutions
Program Summary	• Consolidates QHEC and Home Performance programs • Free in-person energy audits, identifying energy performance improvement opportunities • Only available to LMI residential customers • Provide electrification-focused incentives and weatherization; phases out efficiency incentives • Supports local workforce through contractor partnerships
Target Market & Stakeholders	• Residential customers
Regulatory Framework & Utility Precedent	• EmPOWER Weatherization Assistance Program[82] • Energize Connecticut Home Energy Solutions – Income Eligible (HES-IE)[83]
District Goal Alignment	• 2032: Reduce energy use by 50% (CEDC Act) • 2035: 100% new & replacement electric heat and hot water systems (Carbon Free DC) • 2040: 90% building electrification (Carbon Free DC)
Customer Value	• **Affordability:** Reduce energy burden • **Equity:** Increase access to services and resources for LMI customers • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification • **Sustainability**: Encourage efficiency
Related Programs	• Quick Home Energy Check-Up • Home Performance • Dedicated LMI Electrification

6.2.5 Retro-commissioning

The **Retro-commissioning** program would help commercial customers improve building performance through a building operator training program followed by personalized data-driven recommendations for operational enhancements. The Retro-commissioning program is designed to support building owners and operators in transforming their buildings into more comfortable and energy-efficient environments.

Eligible participants would receive an incentive covering the cost of approved courses and workshops that train facility operations staff to manage energy use more efficiently.

[82] EmPOWER Weatherization Assistance Program
[83] Energize CT HES-IE

After completing the training, Pepco will offer additional incentives and technical assistance to help customers fine-tune existing central building systems—such as HVAC, lighting controls, and energy management systems—without requiring major capital investments. Using data from AMI or building automation systems, Pepco would work directly with building operators to review energy performance and identify inefficiencies that may have developed over time due to changes in building use, equipment aging, or less-than-optimal maintenance practices.

Similarly, the training program would enable customers to implement low-cost strategies and benefit from long-term energy savings, extend equipment life, and reduced emissions. As such, the **Retro-commissioning** program would provide an avenue to continue reducing loads through energy efficiency through the 10-Year Plan with limited investment from either Pepco or the customer. This program may also direct customers to other Pepco solutions for even deeper energy savings. Finally, the program encourages expansion of smart energy systems to access this and complementary programs, promoting grid interactivity as the building receives upgrades.

Retro-commissioning	
Portfolio & Initiative	Decarbonizing Buildings – Behavioral & Technical Solutions
Program Summary	• Initial virtual analysis of building's energy performance leveraging AMI data • Identify and recommend potential controls or operations-based energy efficiency measures and operational adjustments to fine-tune building system performance and energy consumption • Provide complementary building operator training, leveraging workforce partnerships
Target Market & Stakeholders	• Commercial customers
Regulatory Framework & Utility Precedent	• NYSERDA Retro Commissioning[84] • Pepco MD Building Tune-up[85]
District Goal Alignment	• 2032: Reduce energy use by 50% (CEDC Act)
Customer Value	• **Affordability:** Reduce energy burden • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability**: Encourage efficiency
Related Programs	• Commercial Prescriptive & Custom Incentives • Performance Based Incentives

[84] NYSERDA Retro-commissioning
[85] Pepco MD Building Tune-Up

Building Upgrades
Customer Incentives: 10-Year Plan

6.2.6 Performance Based Incentives

The **Performance Based Incentives** program is proposed to deliver longer-term energy savings across commercial and residential customer segments, above and beyond that required by BEPS and NZE codes. In contrast to prescriptive incentives – which generally offer a fixed rebate value for each eligible installed upgrade – this program provides financial incentives calculated on measured kilowatt-hour (kWh) savings, against a baseline scenario expected under relevant building codes.

This type of incentive can be more appropriate for larger, more complex upgrades which do not readily fall into prescriptive or custom categories, and which may be otherwise uneconomical or overlooked. In doing so, the program provides an incentive for whole-building or system-wide upgrades that deliver the most impactful outcomes, driving deeper savings than simple equipment installation may be able to achieve. For example, a chiller replacement in a commercial building can deliver significant energy savings, but the system's overall efficiency will ultimately depend on the design in consideration of cooling demand, operational patterns, and considerations such as redundancy or modularity, as well as ancillary elements such as chilled water piping insulation and controls. In this case, a one-size-fits-all rebate may not readily apply across all potential configurations or to all design features which contribute to energy savings. Instead, custom incentives can be determined based on expected performance improvements relative to baseline and incorporated into analysis to inform the most cost-effective solution.

The program further encourages sustained actual energy performance and grid load reduction through both upfront modeling and ongoing measurement and verification (M&V). System plans and modeled savings would be provided to Pepco for review and approval, with ongoing verification of savings based on billing data. The program would require integration of smart energy systems and AMI for M&V activities and to continue development of a more interactive grid.

Performance Based Incentives	
Portfolio & Initiative	Decarbonizing Buildings – Building Upgrades
Program Summary	• Customizable performance-based incentive (per kWh saved) to encourage whole-building upgrades for deep energy reductions • Employ standardized energy simulation software to estimate savings, and AMI and smart building system to verify savings and paid incentives

Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• Pepco MD Medium and Large Businesses program[86] • Pepco MD Small Business program[87]
District Goal Alignment	• 2032: Reduce energy use by 50% (CEDC Act) • 2035: 100% new & replacement electric heat and hot water (Carbon Free DC) • 2040: 90% building electrification (Carbon Free DC)
Customer Value	• **Affordability:** Deliver customer compensation • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification • **Sustainability**: Encourage efficiency
Related Programs	• Efficient Products Incentives • Behavioral & Technical Solutions • Retro-commissioning

6.2.7 Full Appliance Electrification

The **Full Appliance Electrification** program reimagines and modernizes the Efficient Products prescriptive program offered under the 5-Year Plan. The program aligns with District-wide decarbonization and electrification goals by providing market-rate point-of-sale prescriptive rebates to homeowners and small businesses for the adoption of electric appliances, replacing outdated, inefficient equipment that rely on fossil fuels as the primary source of energy.

This program is designed to accelerate the transition to fully electric homes and buildings by reducing the upfront cost barriers of clean electric technologies. It would support customers in making the switch from fossil fuel-powered or non-electric appliances to energy-efficient, electric alternatives that utilize heat pump technology, reduce GHG emissions and improve indoor air quality. Eligible appliances may include induction stovetops, heat pump dryers, and pool pumps. For larger systems such as water heaters and HVAC systems, to the extent practicable, rebates will be exclusively for smart devices/equipment that can enable customer participation in DR programs to manage energy burden and grid loads for more energy intensive equipment. This program may be paired with the **Electrification Make-Ready** program to provide service heavy-ups that may be needed to accommodate increased electric load.

[86] Pepco, Medium and Large Business
[87] Pepco, Small Business

Full Appliance Electrification	
Portfolio & Initiative	Decarbonizing Buildings – Building Upgrades
Program Summary	• Provide point-of-sale rebates for new electric appliances with smart capabilities
Target Market & Stakeholders	• Residential customers • Commercial customers
Regulatory Framework & Utility Precedent	• Pepco MD Appliance Rebates[88]
District Goal Alignment	• 2035: 100% new & replacement electric heat and hot water systems (Carbon Free DC) • 2040: 90% building electrification (Carbon Free DC)
Customer Value	• **Affordability:** Deliver customer compensation • **Equity:** Increase access to infrastructure, services, and resources • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification
Related Programs	• Efficient Products Incentives • Electrification Make-Ready

6.2.8 Dedicated LMI Electrification

The **Dedicated LMI Electrification** program is an equity-focused initiative designed to support LMI households in transitioning to fully electric homes by offering higher rebates and incentives than those offered in the standard Full Appliance Electrification program. The program builds on the LMI-Only In-Depth Audit program and would provide enhanced rebates and financial support for high-impact electrification upgrades, helping to ensure that all customers can participate in and benefit from the clean energy transition, regardless of income level.

LMI households often face greater structural and financial barriers to electrification, including older building infrastructure, outdated mechanical systems, and limited access to sufficient capital for more costly full appliance replacements. The Dedicated LMI Electrification Program directly addresses these barriers by targeting meaningful financial assistance toward the most critical and cost-intensive upgrades, ensuring that these customers are not left behind in the region's push toward decarbonization. Customers who complete the LMI-Only In-Depth Audit will be automatically eligible for this supplemental program, which provides increased rebates and full or partial cost coverage for heat pumps, heat pump water heaters, induction stovetops, and more. Where applicable, appliances funded under this program will be subject to smart device

[88] Pepco MD Appliance Rebates

requirements to enable DR participation to facilitate customer energy cost savings, bill credits, and demand side management.

Dedicated LMI Electrification	
Portfolio & Initiative	Decarbonizing Buildings – Building Upgrades
Program Summary	• Provide increased point-of-sale rebates for new electric appliances with smart capabilities for LMI customers • Supplements the LMI audit program • Provides increased rebates for electric heat pumps, water heating, clothes drying, cooking appliances and more, with smart
Target Market & Stakeholders	• Residential customers
Regulatory Framework & Utility Precedent	• EmPOWER MD Limited Income Energy Efficiency Program (LIEEP)[89]
District Goal Alignment	• 2035: 100% new & replacement electric heat and hot water systems (Carbon Free DC) • 2040: 90% building electrification (Carbon Free DC)
Customer Value	• **Affordability:** Reduce energy burden • **Equity:** Increase access to services and resources for LMI customers • **Sustainability:** Enable electrification
Related Programs	• Efficient Products Incentive • Full Appliance Electrification

6.2.9 Emerging Technologies Pilot

The **Emerging Technologies Pilot** program is a commercial sector pilot designed to accelerate the adoption of emerging or underutilized energy efficiency and beneficial electrification technologies. In particular, this program will focus on technologies that are not yet commercially viable but will mature and be ready for deployment in the next five to 10 years. This program will focus on bridging the gap between market readiness and widespread implementation by providing enhanced incentives, training, and technical support to help customers, vendors, and service providers understand and capture the full value of advanced efficiency measures. Examples of eligible measures may include advanced HVAC systems, smart building controls, high performance building envelope improvements, heat recovery systems, refrigeration, and other industry-specific technologies.

Adoption of high-performance technologies often lags due to limited awareness, higher upfront costs, lack of contractor familiarity, or untested market confidence. This program

[89] EmPOWER MD LIEEP

is intended to overcome those barriers by offering targeted support to encourage real-world deployment of next-generation energy solutions in commercial buildings. The program will offer customized incentives for a curated set of high-impact, underutilized technologies that show strong potential for broader market adoption. Systems not eligible under the pilot may still be considered for customized savings under the **Performance Based Incentives** program.

The program is offered in recognition and support of the expected growth of emerging energy technologies through the 10-Year Plan period, even as Pepco's primary focus in the built environment will continue to shift towards electrification.

Emerging Technologies Pilot	
Portfolio & Initiative	Decarbonizing Buildings – Building Upgrades
Program Summary	• Energy efficiency pilot for commercial customers • Targets new technologies and approaches that are ready for broader adoption • Help the market understand the value proposition of advanced efficiency measures
Target Market & Stakeholders	• Commercial customers
Regulatory Framework & Utility Precedent	• ComEd Beneficial Electrification (BE) Pilots[90]
District Goal Alignment	• 2032: Reduce energy use by 50% (CEDC Act) • 2040: 90% building electrification (Carbon Free DC)
Customer Value	• **Affordability:** Deliver customer compensation • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification • **Sustainability**: Encourage efficiency
Related Programs	• Commercial Prescriptive & Custom Incentives • Performance Based Incentives

[90] ComEd BE Pilots

6.3 Activating the Local Energy Ecosystem

10-Year Plan

In the 10-Year Plan, this portfolio identifies programs aimed at increasing DER penetration, enabling greater resource sharing between Pepco and its customers, and enhancing overall resource adequacy. As DERs are an essential component to both serving growing electric loads and meeting decarbonization targets, these initiatives are designed to foster deeper Company collaboration with solar hosts and developers while expanding access to the benefits of local clean energy to customers District-wide.

Interconnection Solutions: Enhance utility-hosted technical resources to better support customers and developers in siting, planning, and executing DER projects. By improving access to interconnection data, tools, and technical guidance, this initiative helps ensure that projects can move forward more efficiently and cost-effectively to increase local solar.

DER Upgrades: Establish a new suite of financial solutions to bolster the financial case for batteries and other DER technologies. The goal of this initiative in the 10-Year Plan is to maximize the grid value of DERs while ensuring equitable access to these technologies for all customer segments.

Between new programs and those continued from the 5-Year Plan, the Company's efforts in the 10-Year Plan strengthen Pepco's ability to integrate expanding DERs, enhance customer engagement, and improve grid flexibility over the long term. The following list outlines programs introduced in the 5-Year Plan proposed to be continued, along with a summary of any planned updates or adjustments for the 10-Year Plan.

- **DER Hosting Capacity Maps:** Build on the hosting and capacity data developed in the 5-Year Plan to implement proactive hosting capacity planning. This includes identifying optimal locations for DER deployment and making that information publicly available to help guide developers and customers interested in installing DERs.
- **Microgrid Standby Tariff:** Maintain standby rate with updates as appropriate based on participant data, feedback, and general rate case proceedings.
- **Public-Facing Interconnection Queue:** Maintain public-facing queue database.
- **Monthly Project Cost Variance Report:** Maintain monthly report on DER project cost variance.
- **Battery Incentives:** Maintain program as identified in the 5-Year Plan and refine incentive structure based on adoption and stakeholder feedback.
- **VPP Program:** Continue program with refined pay for performance compensation model and expanded grid services, making assets eligible for compensation beyond DR programs.

The following programs are new additions Pepco proposes for the 10-year timeframe, building on the successes and lessons learned from the 5-year plan.

Interconnection Solutions
Pepco Programming: 10-Year Plan

6.3.1 Battery Arbitrage Tariff

BESS energy arbitrage is the practice of charging batteries in off-peak periods when energy is cheaper and discharging power when demand is high and power is more costly, in order to capture the difference in energy value. The **Battery Arbitrage Tariff** will pilot a mechanism to enable customers that own behind-the-meter BESS to use their systems for energy arbitrage. The program will demonstrate an additional revenue stream for BESS to support the financial case for third-party investment in critical assets in the energy transition. At the same time, the program utilizes rate signals to incentivize the use of distributed storage assets to enhance grid-wide operations and resource adequacy through peak shaving and renewables utilization.

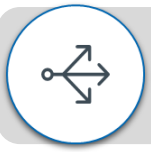
The 5-Year Plan establishes TOU rates for residential homes and residential EV charging which reflect the variance in energy costs throughout the day. The **Battery Arbitrage Tariff** will provide a similar TOU rate specific to BESS operations, encouraging customers seeking to charge their batteries with grid power to do so when rates and demand are low. By applying TOU rates only to BESS charging activities, the program is more accessible to customers as it does not require whole-facility behavioral shifts in order to realize the benefit.

Whether originally from grid power or from paired customer DERs, BESS energy discharge may be covered by established net energy metering rates, a modified “time of export” rate that complements the TOU rate, or a dynamic rate which reflects real-time grid conditions, to be determined during the pilot design. Rates for energy dispatched from participating customer BESS will be right sized to encourage the supply of power back to the grid, reflecting the value of the service provided to customers District wide.

This tariff is designed as a win-win: it provides customers with energy cost savings and revenue opportunities to improve payback on battery investments, while enabling Pepco to leverage distributed storage for enhanced grid flexibility and resilience. Pepco will design and launch this pilot under the 10-Year Plan to inform future rate design and DER integration strategies for the 15-Year Plan.

Battery Arbitrage Tariff	
Portfolio & Initiative	Activating the Local Energy Ecosystem – Interconnection Solutions
Program Summary	• Pilot tariff comprised of TOU rates and net energy metering for customers with behind-the-meter BESS to participate in energy arbitrage • Applied to energy consumption and export related to BESS only

Target Market & Stakeholders	• Residential and commercial customers with behind-the-meter BESS
Regulatory Framework & Utility Precedent	• APS Residential Battery Pilot[91]
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2032: 100% of residents live within walking distance of a facility offering clean backup power during outages (Sustainable DC)
Customer Value	• **Affordability:** Deliver customer compensation • **Reliability:** Manage peak load • **Interactivity:** Integrate smart devices and data • **Sustainability:** Enable electrification
Related Programs	• Battery Incentives



6.4 Enhancing Infrastructure for Climate Solutions

10-Year Plan

Pepco's 10-Year Plan for the *Enhancing Infrastructure for Climate Solutions* portfolio outlines a strategic path for modernizing core energy infrastructure to meet the District's evolving climate, electrification, and equity goals. This portfolio continues to invest in climate-aligned Company operations and assets while introducing new interactive solutions to accommodate increasing and evolving loads and to maintain grid resilience. The initiatives below reflect both the continuation and evolution of earlier efforts, ensuring that both Pepco's energy supply and its infrastructure continue their progression towards decarbonization milestones.

Power Service Solutions: Expands approach to wholesale renewable energy procurement, including exploring new contract mechanisms that improve price certainty while maximizing carbon-free generation. This initiative supports deep decarbonization by ensuring that growing electric demand from buildings, transportation, and appliances is met with increasingly clean energy.

Infrastructure Upgrades: High-impact distribution system upgrades that enhance grid flexibility, support growing peak loads, and enable bi-directional energy flow from customer-sited resources. Investments will be prioritized in areas with the greatest potential for community benefit and DER deployment, leveraging advanced analytics, automation, and monitoring technologies.

The solutions under this portfolio in the 5-year Plan are largely carried over into the 10-Year plan with select complementary programs introduced in the 10-Year Plan that

[91] APS Residential Battery Pilot

position the Company to better integrate carbon-reducing technologies, both distributed and at-scale. The following list includes those programs introduced in the 5-Year Plan, along with a summary of any planned modifications in the 10-Year Plan.

- **Expanded Green Rider:** Continue through 2031 in consideration of the current RPS, and end program when 100% RPS is achieved, by 2032.
- **IDSP Planning & Forecasting:** Update and implement IDSP in coordination with transmission planning efforts and outcomes of FC1182 and IDSP Working Group.
- **Radial Capacity Hosting:** Implement priority Radial Capacity improvements as identified via siting, IDSP, and capital planning efforts, subject to Commission approval.

The following programs are new additions Pepco proposes for the 10-year timeframe, building on the successes and lessons learned from the 5-year plan.

Power Service Solutions
Pepco Programming: 10-Year Plan

6.4.1 Utility-Scale Battery Grid Services

Large scale energy storage is a necessary component of a modern, decarbonized energy system. In parallel with the **Grid-Facing Battery** program detailed in Section 6.4.2 below, the **Utility-Scale Battery Grid Services** program will evaluate potential to use Company-owned, utility-scale BESS to deliver essential grid services as the energy transition accelerates. This program will identify and evaluate optimal structures, value streams, and operational models for a Pepco-owned BESS to deliver a range of grid services, such as stabilization, energy arbitrage, load shifting and peak shaving, capacity firming, renewable energy integration, volt-var support, or sales into various PJM markets such as frequency regulation. At its core, the program aims first to validate Pepco's business case of large-scale storage to inform **Grid-Facing Battery** development and second to accelerate broader future deployment, whether by Pepco or third-parties. Lessons learned may help shape rate structures and interconnection practices that facilitate commercial development of large-scale storage as a foundational component of the modern Pepco grid.

Utility-Scale Battery Grid Services	
Portfolio & Initiative	Enhancing Infrastructure for Climate Solutions – Supply Solutions
Program Summary	• Evaluate structure, grid value, and revenue potential of various grid services from utility-owned BESS
Target Market & Stakeholders	• All customers
Regulatory Framework & Utility Precedent	• NYSERDA Bulk Energy Storage Program[92]
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act)
Customer Value	• **Equity:** Distribute benefits across communities • **Equity:** Increase access to infrastructure, services, and resources • **Reliability:** Manage peak load • **Reliability** Contribute to resource adequacy • **Interactivity:** Expand grid visibility and management • **Sustainability:** Integrate clean energy
Related Programs	• Grid-Facing Battery

[92] NSERDA Bulk Energy Storage Program

Infrastructure Upgrades
System Investment: 10-Year Plan

6.4.2 Grid-Facing Battery

In addition to customer-hosted behind-the-meter batteries, the District can benefit from grid services delivered via utility-scale BESS, such as stabilization, energy arbitrage, load shifting and peak shaving, capacity firming, and renewable energy integration. Depending on the use case, grid-facing BESS may provide benefits in terms of operational resilience, resource adequacy, revenue generation to be passed onto customers, or support for the District RPS. These flexible applications are increasingly important as renewables penetration, electrification, and interactive grid elements increase, resulting in more dynamic load.

In the 10-Year Plan horizon, Pepco will initiate efforts to plan, site, develop, and install a Pepco-owned BESS, subject to regulatory approval. As a utility-led effort, this program will evaluate the planning, permitting, and investment pathways necessary to integrate BESS into Pepco's distribution system. In parallel, the Company will evaluate various grid service functions and operational regimes as detailed under Section 6.4.1 to inform design, technical requirements, business model, and affordability. Siting is likely to pose a key challenge as available, suitable land in the District is limited and distribution upgrades are likely to be required for interconnection, increasing cost. Should a favorable delivery pathway be identified and approved for a technically and financially viable project, this effort would be advanced in partnership with qualified contractor partners to support delivery and long-term operations.

Together with the **Utility-Scale Battery Grid Services** program, this program seeks to establish a repeatable business model for future utility-scale storage resources to deliver high-impact benefits at the grid level.

Grid-Facing Battery	
Portfolio & Initiative	Enhancing Infrastructure for Climate Solutions – Infrastructure Upgrades
Program Summary	• Site, develop, and install a utility-scale grid-facing BESS to provide grid services such as stabilization, energy arbitrage, load shifting and peak shaving, capacity firming, or renewable energy integration
Target Market & Stakeholders	• All customers
Regulatory Framework & Utility Precedent	• Formal Case No. 1130 PowerPath DC

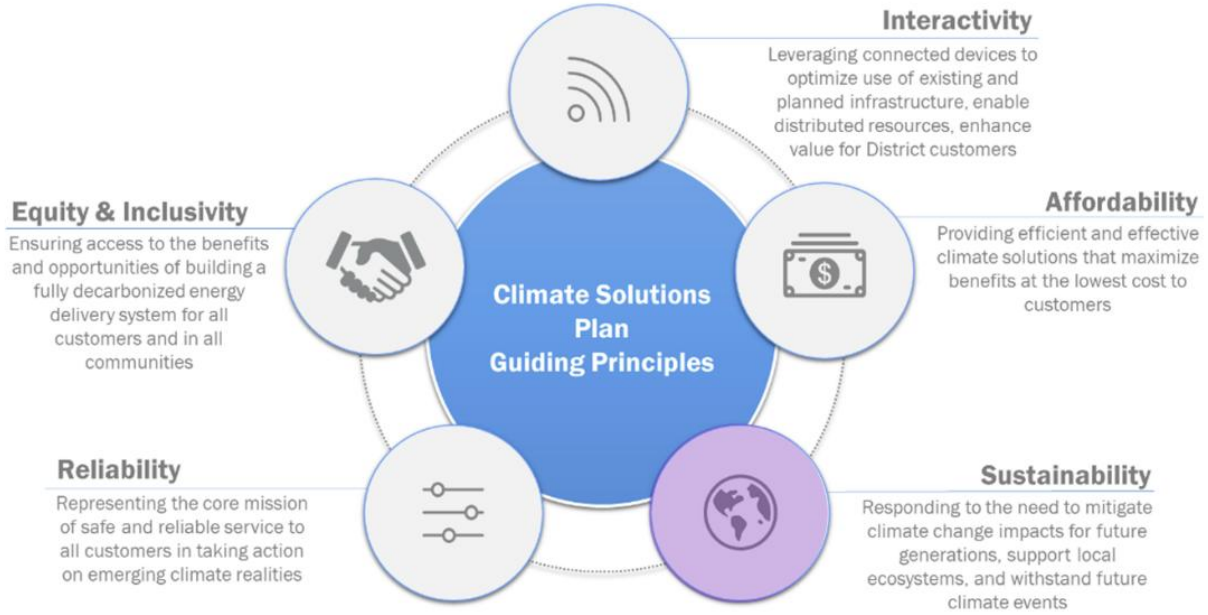
	• Eversource Battery Energy Storage[93]
District Goal Alignment	• 2032: 100% renewable energy supply (CEDC Act) • 2032: 100% of residents live within walking distance of a facility offering clean backup power during outages (Sustainable DC)
Customer Value	• **Equity:** Distribute benefits across communities • **Equity:** Increase access to infrastructure, services, and resources • **Reliability** Contribute to resource adequacy • **Interactivity:** Expand grid visibility and management • **Sustainability:** Integrate clean energy
Related Programs	• Utility-Scale Battery Grid Services

[93] Eversource Battery Energy Storage

7 Climate Solutions 15-Year Plan

Pepco's 15-Year Plan guides the Company's sustained evolution into a decarbonized, modern energy platform for customers and grid-connected assets. Building on the developments of the 5- and 10-Year Plans, the 15-Year Plan looks beyond current technologies and market dynamics for solutions that Pepco can deploy between 2036 and 2040 to help enable carbon neutrality in the District by 2045. Similar to the 10-Year Plan, the 15-Year Plan assumes steady progress towards established policy goals, as facilitated by Pepco's programming over the period. Over this time, Pepco's role will evolve from one-way service provider to energy system facilitator, in lockstep with growing customer engagement and third-party investment at the grid-edge. While Pepco embraces its critical role in enabling and accelerating the energy transition, the 15-Year Plan reflects that the "last mile" to full decarbonization is not possible without the active participation of a broad consortium of District stakeholders.

The 15-Year Plan programs are at the nexus of all five Guiding Principles, with particular emphasis on **sustainability**. These principles reflect a commitment not only to reduce GHG emissions, but also to align utility investments with climate resilience, resource adequacy, long-term affordability, and equity in service quality and environmental benefits. As highlighted in the Guiding Principles, **sustainability** encompasses responsible management of clean and local energy resources, as well as robust and adaptive utility operations. Both elements are required to maintain reliable, resilient, and decarbonized utility service in the long-term – in the face of evolving energy, customer, and climate needs.



The 15-Year Plan is underpinned by sustained programming introduced in the 5- and 10-Year Plans and coordinates Company policy, connected data, and utility-owned and third-party infrastructure to empower road participation in the energy transition. The 15-Year

Plan refines and scales successful programs introduced in the previous planning periods but is intended to maintain flexibility to adapt to emerging technologies, regulatory developments, and market shifts. Rather than introducing numerous new programs, the 15-Year Plan seeks to optimize established programming, to deepen customer participation and encourage third-party investment as 2045 targets draw nearer.

As in previous plans, the 15-Year Plan will reflect performance data and stakeholder feedback on programs as well as emerging markets, policy, and technology trends. The below sections detail new potential programs which Pepco may implement under each portfolio throughout the 15-Year Plan, separated by portfolio and initiative. Each portfolio identifies those programs which may be continued and updated from previous planning periods. In all portfolios, programs remain subject to evaluation under BCA, affordability, and program impact, among other factors.

7.1. Electrifying Transportation

15-Year Plan

In the 15-Year Plan, the Electrifying Transportation portfolio aims to leverage widespread expected EV adoption – in line with District goals – to enable more effective load management and increased renewable energy integration from DERs.

EV Rate Solutions: Provide rate structures that allow expanded customer segments to balance loads using their EVs across a broader set of applications. Promote EV accessibility through a variety of use cases that can support the economic case for fuel switching.

EV Make-Ready Upgrades: Deploy enabling infrastructure to expand use of EVs as grid-edge DERs for peak shaving, enhanced local solar utilization, and distributed load management. Facilitate customer-level system upgrades that distribute benefits of grid-connected technologies across the District.

The 15-Year Plan identifies targeted new programs aimed at advancing the Company's vision of an interactive grid. Pepco also anticipates continuing a number of programs identified in the 5- and 10-Year Plan, with potential updates as appropriate to reflect growing customer trends, market adoption, operations and performance data, and stakeholder feedback:

- **Managed Charging:** Maintain program, with refined design elements based on Smart Charger data.
- **EV TOU:** Maintain residential and commercial fleet rates, with refined design elements (e.g., usage rates, TOU windows) based on Smart Charger data.
- **Transit Bus Rate Solutions:** Maintain rate solution deployed in the 10-Year Plan and refine over time with Smart Charger data.
- **V2G Compensation:** Scale prior pilot to full deployment of V2G. Develop and launch pilot to enable V2G compensation from any eligible bi-directional charger, including public chargers, rather than being limited to EV power dispatch from the customer-registered bi-directional charger.
- **V2G Deployment:** Expand rebate incentives to additional use cases to enable power supply from EVs to additional property types (e.g., multi-unit dwellings), charger types (e.g., public chargers), and loads. V2X may accommodate EV power delivery to individual loads, buildings, and other vehicles, in addition to the grid.
- **Bundled Level 2 Charging & DERs:** Continuation subject to solar penetration and EV adoption rates, in addition to program performance and feedback. Streamline program to offer EV charger control-only solution to more effectively manage EV charging in periods of customer-installed solar system production versus charging from the grid.

7.1.1 Surplus Period Charging

EV conversion is a critical element of the energy transition, serving to electrify a major GHG emissions contributor and reduce dependency on fossil fuels. While EV charging represents an increase in demand on the grid, their distributed use and integrated batteries also present an opportunity to balance loads and integrate renewable energy. The **Surplus Period Charging** program would leverage the dynamic pricing design of the **Critical Peak Rebate** program to offer reduced electric rates for EV charging during periods in which renewable energy production exceeds loads. Participating residential and fleet customers would be notified when rebates are available, and Pepco may investigate mechanisms in partnership with third-party charging operators to deploy the program for publicly accessible chargers. The program would serve to increase renewable penetration, align supply and demand for resource adequacy, and increase affordability of EV ownership through reduced fueling costs. The program would increase the scale of the **Bundled Level 2 Charging & DERs** to encourage EV charging with local renewable energy at a District level, rather than at the customer level.

Surplus Period Charging	
Portfolio & Initiative	Electrifying Transportation – EV Rate Solutions
Program Summary	• Offer customers discounted charging when renewable energy generation exceeds loads
Target Market & Stakeholders	• Residential customers • Fleet operators • Commercial charger owner/operators
Regulatory Framework & Utility Precedent	• Pepco MD Peak Energy Savings Credit[94] • BGE Peak Rewards[95]
District Goal Alignment	• 2041: 15% of District energy supply from local solar (Local Solar Expansion Amendment Act of 2022)
Customer Value	• **Affordability:** Reduce energy burden • **Reliability:** Manage peak load • **Interactivity:** Expand grid visibility and management • **Sustainability:** Integrate clean energy
Related Programs	• Critical Peak Rebate

[94] Pepco MD Peak Energy Savings Credit
[95] BGE Peak Rewards

7.2. Decarbonizing Buildings

15-Year Plan

In recognition of strides made through 2036 towards achieving the District's climate goals, including 100% renewable energy supply by 2032, adoption of BEPS and NZE codes, and electrification of new and replacement appliances, Pepco does not currently plan to introduce new programs under the Decarbonizing Buildings Portfolio in the 15-Year Plan. Instead, the focus will be on enhancing participation in and effectiveness of established programs, to manage customer energy burden and grid loads as electrification increases and customer demand grows.

Building Rate Solutions: Advance data-informed rate design and DR programs in recognition of the impact of electrification on the distribution system and the customer alike.

Behavioral & Technical Solutions: Increase customer participation in established programs and focus investment on hard-to-reach systems and communities facing the greatest barriers to adoption.

Building Upgrades: This initiative will accelerate building decarbonization in the 15-year plan by leveraging established programs in previous years to deliver sustained energy and bill savings opportunities over time.

Sustaining and refining established programs over a longer period allows for greater market awareness, improved program delivery, and more meaningful customer engagement. This strategy further promotes affordability through continued impact and cost-effectiveness. The following list identifies programs introduced in the 5- and 10-Year Plans, along with a summary of any envisioned updates for the 15-Year Plan.

- **Residential TOU Rate:** Maintain rate and refine based on customer use patterns measured through smart devices and billing data.
- **Commercial TOU Rates:** Maintain rates and refine based on customer use patterns measured through smart devices and billing data.
- **Critical Peak Credit:** Maintain program as identified in the 10-Year Plan and refine as needed as loads shift.
- **All Electric Rate:** Phase out or converge with standard rates as part of ongoing rate adjustments based on customer rates of full electrification.
- **Demand Side Management:** Implement full-scale program with diversified residential and commercial applications, incorporating pilot findings on best-suited and most impactful technologies.
- **Direct Load Control:** Maintain program as outlined in the 5- and 10-Year Plans.
- **Schools and Education:** Maintain the program as included in the 5-Year Plan, with refreshed curriculum based on feedback and best practices identified through implementation.

- **Commercial Customer Portal:** Continue to refine platform based ongoing implementation and feedback.
- **No-Cost Home Energy Reports:** Maintain program and continue to refine data/presentation based on customer feedback from the 5- and 10-Year Plans.
- **LMI-Only In-Depth Audit:** Maintain program as outlined in the 10-Year Plan, updating eligible upgrades and incentives based on observed rates of adoption and market needs.
- **Commercial Retro-commissioning:** Maintain the program as identified in the 10-Year Plan and refine as needed.
- **Electrification Make-Ready:** Maintain program as included in the 5-Year Plan, with a refined incentive structure based on program success in the 10-Year Plan. Consider additional eligibility requirements such as facility or distribution system age, or income qualification.
- **Commercial Prescriptive and Custom Incentives:** Continue program, targeting central system electrification only (e.g., central air, hot water). By focusing on the largest energy consumers and most costly upgrades, program impact can be enhanced, as low-hanging fruit is addressed through previous initiatives and BEPS.
- **Residential New Construction & Major Renovations:** Continue program, focusing on select BEPS elements such as DERs, electrification, and smart technologies based on performance against District goals.
- **Performance Based Incentives:** Maintain the program as considered in the 10-Year Plan and refine as needed.
- **Dedicated LMI Electrification:** Maintain the program as detailed in the 10-Year Plan to support underserved customers. Meanwhile, the Full Appliance Electrification program will sunset following the 10-Year Plan period, as electric appliance adoption increases, and technology costs decrease.
- **Emerging Technologies Pilot:** Implement full scale commercial program based on findings from the pilot in the 10-Year Plan. Evaluate potential pilots for the residential segment to promote adoption of innovative technologies.

7.3 Activating the Local Energy Ecosystem

15-Year Plan

As local solar and DER adoption increases in the period, Pepco's Activating the Local Energy Ecosystem Portfolio seeks to deepen DER integration and expand customer participation in grid services in the 15-Year Plan. Beyond simply deploying generation assets, effective grid-level dispatch and management of distributed energy resources is critical to achieving high renewables penetration while maintaining reliable electric service.

Interconnection Solutions: Provide access to tools and establish policy frameworks to facilitate and encourage integration of customer-generated renewable power into the District energy ecosystem.

DER Upgrades: Provide financial incentives to uphold the value proposition for customer BESS adoption. In addition to making DER ownership more accessible to customers, these programs are intended to share the benefits of these systems community-wide while providing fair compensation for participation in grid services.

This portfolio will contribute to decarbonization targets by facilitating the dynamic exchange of energy resources between customers and with the grid – essential to maximizing use intermittent, distributed resources while meeting system loads. The following list includes programs introduced in the 5- and 10-Year Plans, along with a summary of any planned updates or adjustments for the 15-Year Plan.

- **DER Hosting Capacity Maps:** Maintain hosting capacity maps and continuously update with improved data and insights.
- **Public-Facing Interconnection Queue:** Maintain public-facing queue database.
- **Monthly Project Cost Variance Report:** Maintain monthly report on DER project cost variance.
- **Microgrid Standby Tariff:** Maintain standby rate with updates as appropriate based on participant data, feedback, and general rate case proceedings.
- **BESS Arbitrage Tariff:** Refine pilot rates and structure from the 10-Year Plan based on participant data, feedback, and grid needs to deploy full scale rate solution.
- **BESS Incentives:** Maintain programming and refine incentive structure as needed in consideration of market adoption and technology costs.
- **VPP Program:** Continue pay-for-performance compensation structures with expanded regimes for various grid service applications.

7.4 Enhancing Infrastructure for Climate Solutions

15-Year Plan

In the 15-Year Plan, the Enhancing Infrastructure for Climate Solutions portfolio continues to advance Company investments in a modern grid that is equipped to manage the dual challenges of a decarbonized energy supply and evolving customer needs. Complementing growing DERs in Section 7.3, this portfolio seeks to provide a foundation of clean utility power supply, large-scale grid services, and core distribution infrastructure to reliably deliver decarbonized electric service to all customers and diverse grid-connected loads.

Power Service Solutions: Deliver utility-scale clean energy balanced with effective grid services to ensure that electrification is powered by sustainable, dependable energy.

Infrastructure Upgrades: Pursue targeted, high-impact system enhancements (both hardware and software) to control supply, demands, and grid-edge resources with increasing responsiveness as connected assets grow in size, quantity, complexity, and interactivity.

This long-term plan advances the District's decarbonization priorities by strengthening both a clean power service and the infrastructure needed to deliver it to District customers. Within the 15-Year Plan, this portfolio builds on programs introduced in the 5- and 10-Year Plans, expanding and refining them over time. These programs include:

- **Utility-Scale Battery Grid Services:** Launch in coordination with startup of **Grid-Facing BESS**. As appropriate based on identified strategies and market interest, adapt for third-party owned utility-scale BESS systems.
- **IDSP Planning & Forecasting:** Update and implement IDSP in coordination with transmission planning efforts and outcomes of FC1182 and IDSP Working Group.
- **Radial Hosting Capacity:** Implement priority radial capacity improvements as identified via siting, IDSP, and capital planning efforts, subject to approval.
- **Grid-Facing Battery:** If found to be feasible and approved, start-up and operate utility-owned BESS in accordance with established business model to provide grid services. Evaluate potential to develop additional sites for utility-owned or third-party grid-facing BESS.

Infrastructure Upgrades
System Investment: 15-Year Plan

7.4.1 Private LTE Network

As part of Pepco's long-term grid modernization strategy, the **Private LTE Network** program would deploy high-performance wireless communications to enable advanced control of grid operations. Leveraging a fiber backbone, the PLTE would provide a cybersecure and low-latency platform for real-time management customer and utility endpoint devices in support of the next generation of grid services – maintaining resilient, dynamic grid operations as intermittent and distributed resources become the primary energy source.

A dedicated utility-grade network would enhance Pepco's ability to orchestrate grid operations in a rapidly evolving energy landscape where growing capacity and quantity of DERs, electrified assets, and data management applications demand faster, more reliable, and more flexible grid communications. The private LTE would connect grid-edge technologies and the utility's growing network of industrial internet of things (IoT) sensors and automated controls. Complementing Pepco's enhanced capabilities for rapid fault detection and outage isolation, Pepco would be better able to incorporate distributed resources such as solar, BESS, and EV batteries for system restoration or even prevention.

The private LTE would support the District's overarching decarbonization goals by enabling increased renewable energy utilization as well as smarter energy use through expanded smart meter capabilities, customer engagement tools, and real-time energy management options to reduce curtailment and excessive consumption. Over the 15-Year Plan period, this program would position Pepco to deliver cleaner, more reliable, and more affordable energy service while providing the communications backbone necessary for a modern, interactive, and resilient grid.

Private LTE Network	
Portfolio & Initiative	Enhancing Infrastructure for Climate Solutions – Infrastructure Upgrades
Program Summary	• Secure, real-time wireless communications to better manage the influx of data from grid-connected devices and controls for dynamic operations of a resilient and clean energy grid. • Private LTE builds on a foundational fiber system to provide a cybersecure system for interfacing customer and utility endpoint devices.
Target Market & Stakeholders	• All customers

Regulatory Framework & Utility Precedent	• Xcel Energy Private LTE Network[96]
District Goal Alignment	• 2045: Achieve carbon neutrality (CCA22)
Customer Value	• **Equity:** Increase access to infrastructure, services, and resources • **Equity:** Distribute benefits across communities • **Reliability** Contribute to resource adequacy • **Interactivity:** Expand grid management • **Sustainability:** Integrate clean energy
Related Programs	• DERMS • Demand Response Programs

[96] Xcel Energy PLTE

An Assessment of Electrification Impacts on the Pepco D.C. Distribution System

VOLUME I: SUMMARY REPORT

PREPARED BY

Ryan Hledik
Akhilesh Ramakrishnan
Adam Bigelow
Sanem Sergici
Michael Hagerty
Oliver Grocott
Tina Zhang

PREPARED FOR

Pepco

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Brattle

Notice

This report was prepared by The Brattle Group for Pepco. It is intended to be read and used as a whole and not in parts. The report reflects the analyses and opinions of the authors and does not necessarily reflect those of The Brattle Group's clients or other consultants.

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Contents

1. Summary

Introduction

The purpose of this study is to provide a granular estimate of the capacity expansion investments needed for Pepco's distribution grid to support full electrification, in line with the District's climate goals and roadmap.

The DC Public Service Commission's Order 22313[1] directed Pepco to develop a granular electrification impact study with detail on the capital expenditures needed for the electric grid to support full electrification. Further, the Order required the study to consider energy efficiency and load flexibility impacts and account for associated load reductions.

Study scope. This study is intended to inform stakeholders on the distribution grid impacts of electrification and the related value of grid flexibility. It assesses the impacts of achieving the District's electrification goals on the loading of Pepco's electric distribution system – consisting of 827 feeders and 45 substations – and identifies the cost of potential grid upgrade needs, with and without grid flexibility.

The potential role of grid flexibility. This study illustrates the ability of a portfolio of distributed energy resources, energy efficiency, and demand flexibility technologies to mitigate grid upgrades. The study refers to these technologies collectively as "grid flexibility technologies". Grid flexibility is defined as the ability to shift demand or supply to meet grid needs.

Interpreting the Findings

The study is focused on distribution capacity expansion investment needs driven by load growth. Other needs, such as grid modernization or replacement of aging equipment, are outside the scope of this study.

While the study provides feeder-level granularity, it is not a substitute for detailed distribution system planning and is not intended to inform the need for specific projects. It uses average feeder and substation project costs to estimate the investment needed to mitigate projected overloads. More detailed solution scoping may identify additional asset-specific issues, alternative solutions, and refined cost estimates for each specific grid need.

The study illustrates the value of grid flexibility technologies to the distribution grid. It does not assess value to the bulk system and does not include the cost of deploying these technologies. Detailed benefit-cost assessments should be done in the context of specific programs or distribution upgrade deferral opportunities.

The study assumes high electrification levels in 2040 in order to conduct the grid needs assessment in the context of achieving the District's decarbonization goals. It is not necessarily a forecast of the most likely trajectory of technology adoption or load growth.

1 Order 22313, Case Number 1167

Distribution Grid Needs to Support Electrification

Without new grid flexibility, a portion of Pepco's feeders and substations would need to be upgraded to support load growth, more than doubling distribution capex relative to the scenario without new electrification load.

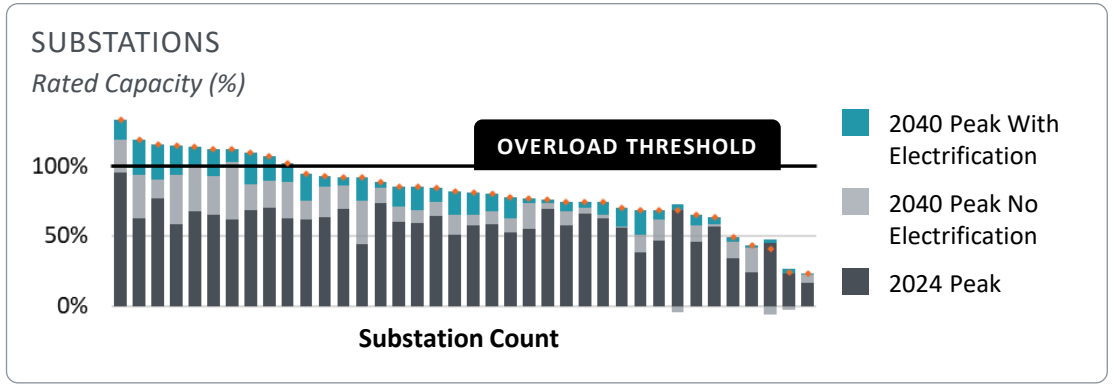
Pepco's feeders and substations currently have significant hosting capacity for load growth, especially in the winter. Due to over a decade of stagnant demand growth, most parts of Pepco's distribution system experience summer peak loads that are less than 75% of rated feeder/substation capacity. Due to the limited amount of electrified heating currently used in the District, winter peaks are significantly lower than summer peaks in most locations, meaning there is even more room for winter load growth.

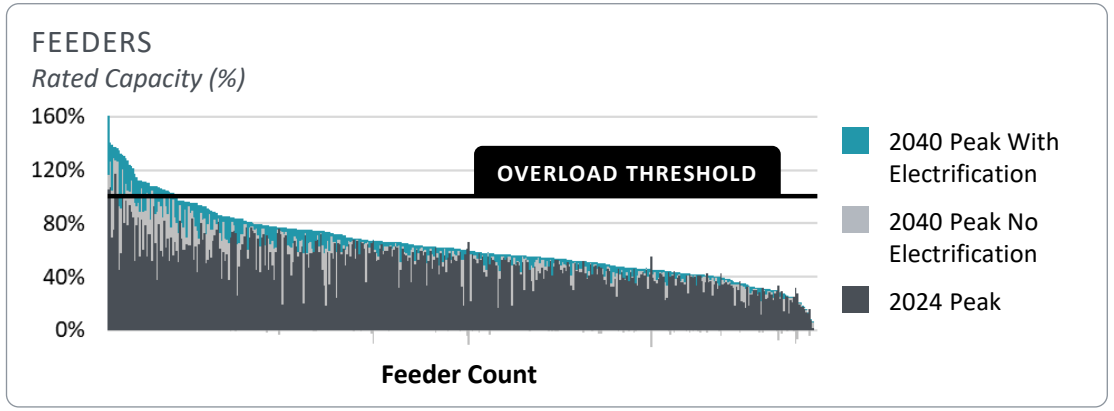
However, even in the absence of new electrification, without additional grid flexibility, Pepco's load is expected to grow 26% by 2040, requiring approximately $665 million[1] in capacity expansion investment. Pepco's distribution system planning process identifies and plans for capacity needs through 2034. Those already-planned upgrades combined with additional upgrades for needs through 2040 result in total estimated "baseline" capex of $665 million, or $44 million/year for the 15-year period from 2025 to 2040.

When accounting for the levels of electrification assumed in this study, total load growth from 2024-2040 is 52%, requiring capacity expansion investment of $1,594 million. That investment requirement represents a 140% increase over the scenario without new electrification load. As a result of electrification, our modeling identifies the need to upgrade 5 feeders and 3 substations, as well as the need to build 26 new feeders and 2 new substations. These results *do not* account for the potential impacts of grid flexibility (see next page).

1 Values throughout this study are reported in 2025 real dollars.

PROJECTED OVERLOADS BY 2040 –
FULL ELECTRIFICATION, NO ADDITIONAL GRID FLEXIBILITY





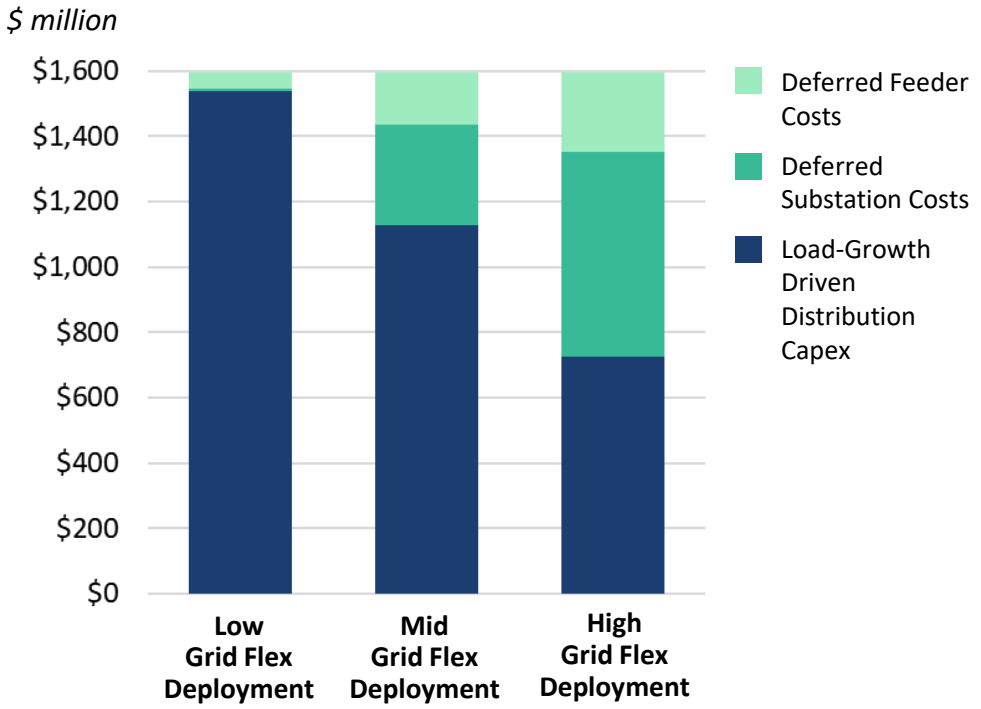
The Potential Role of Grid Flexibility

Deploying a portfolio of grid flexibility technologies could reduce the 2025-2040 capex requirement by $58-$868 million (a 4%-54% reduction). However, the costs of deploying the grid flexibility measures are not included in this analysis and should be studied for cost-effectiveness relative to traditional grid upgrades.

The results highlight that the ability of grid flexibility to defer distribution system investment depends heavily on reaching sufficient levels of grid flexibility adoption. Further, once the largest deferral opportunities are achieved, the incremental value of additional reductions declines. Investment decisions are highly project-specific and each will need to consider the relative cost of grid flexibility, which is not included in this study.

Grid Flex Case	Description	Upgrade Deferral Outcomes
Low Deployment	Representative of meaningful current-day adoption of grid flexibility programs, but with very limited increase in localized solar generation	Several new feeders are avoided, one substation upgrade avoided
Mid Deployment	Represents 2040 adoption levels of 10%-25%, depending on the technology	Many new feeders are avoided, and one high-cost substation build is avoided
High Deployment	Represents 2040 adoption levels nearing the upper limits of the modeled sample technologies' maximum achievable adoption, with levels between 20%-50%	Most electrification-driven new feeders and many substation upgrades are avoided

2025-2040 DISTRIBUTION CAPEX REQUIREMENT WITH VARYING DEPLOYMENT OF GRID FLEXIBILITY TECHNOLOGIES



Key Findings

The Pepco DC system currently has significant capacity headroom for load growth, especially in the winter. Most parts of the system can support electrification loads through 2040 without additional upgrades. However, the areas requiring upgrades due to electrification will increase the total investment need relative to recent levels.

Without grid flexibility, meeting the District's electrification goals could more than double Pepco's capacity expansion expenditures by 2040. Pepco's capacity expansion needs from 2025-2040 are estimated to cost $665 million in a scenario with no additional electrification and $1,594 in a scenario with full electrification and no grid flexibility.

Grid flexibility technologies could be a feasible solution to reduce capacity expansion expenditures. A portfolio of grid flexibility technologies - rooftop solar, batteries, weatherization, cold climate heat pumps, managed EV charging, and smart thermostats – could reduce the required capex by $58 to $868 million (4% to 54%). However, this result does not account for the cost of the grid flexibility measures; more granular cost-effectiveness analysis is an important next step.

There is significant value in targeted deployment of grid flexibility in areas where grid capacity expansion would be particularly expensive. The grid capacity expansion solutions to mitigate overloads have a wide range of costs. Grid flexibility is shown to be particularly valuable to deploy in locations where the most expensive capacity expansion projects may be needed, and where overload conditions are limited in terms of duration, magnitude, and rate of growth.

Scale is essential to achieve grid flexibility value. The distribution value of grid flexibility is highly dependent on deployment reaching significant scale in the locations where it is needed most; moderate levels of deployment are unlikely to produce meaningful distribution benefits.

Cold climate heat pumps are a particularly valuable grid flexibility technology. The efficiency-related savings of cold-climate heat pumps (relative to heat pumps with auxiliary resistive heating) tend to be coincident with the winter peak and can be a major contributor to grid flexibility portfolios that defer the need for grid upgrades.

Batteries provide unique value to the grid flexibility portfolio. Batteries are flexible from both an operational and siting perspective, with the option to take advantage of efficiencies by them at the customer's premise or to attach them to the distribution system where needed most. Batteries can act as the "glue" that enables the rest of the grid flexibility portfolio to provide benefits.

2. Introduction

The District's Decarbonization Goals

The District has adopted several laws and regulations related to the supply, delivery, and use of energy as part of climate initiatives in recent years. Electrification of various end uses in the transportation and building sectors is one of the cornerstones of the District's decarbonization strategy.

SUMMARY OF RELEVANT GOALS AND DIRECTIVES OF RECENT DISTRICT LEGISLATION

2030

- **2026**: Adopt net zero energy construction codes for new buildings[1,3,10]
- **2030:** Reduce GHG emissions by 60%[2]
- **2030:** 25%+ zero-emissions vehicle (ZEV) registrations[1]
  - 68% under ACCII[7,10]
- **2030:** 50% ZEV for public buses, commercial fleets, taxis, limos, & large private fleets[1]

2035

- **2032:** 100% renewable energy supply[1,10]
- **2032:** 100% residents can walk to facility with clean backup power[9]
- **2032:** Reduce energy use by 50%[10]
- **2035:** 100% ZEV registrations[7,10]
- **2035:** 75% ZEV for public buses, taxis, limos, commercial fleets, & large private fleets[1]
- **2035:** New and replacement heat and water 100% electric[8]

2040

- **2040:** 90% ZEV for public buses, commercial fleets, taxis, limos, & large private fleets[1]
- **2040:** 90% electric heat & water[8,10]
- **2041:** 15% local solar[4]

2045+

- **2045:** Carbon neutrality[2]
- **2045:** 100% ZEV for public buses, commercial fleets, taxis, limos, & large private fleets[1,10]
- **2045:** 100% electric heat and water[8,10]
- **2045:** Residual gross emissions of 1.25 MMTCO2 allocated 88% to electric generation, 4% to fossil gas, 4% to gasoline, 2% to diesel, and 2% to waste[8,10]

Source Legislation & Policy Documents

1. *CEDC Omnibus Amendment Act of 2018*
2. *Climate Commitment Act of 2022*
3. *Clean Energy DC Building Code Amendment Act of 2022*
4. *Local Solar Expansion Amendment Act of 2022*
5. *Healthy Homes and Residential Electrification Amendment Act of 2024*
6. *Inflation Reduction Act of 2022*
7. *Advanced Clean Cars II (ACCII) (adopted 2023)*
8. *Carbon Free DC (2023)*
9. *Sustainable DC*
10. *Clean Energy 2.0, DRAFT (2023)*

Study Purpose and Scope

The purpose of this study is to provide a granular estimate of the capacity expansion investments needed for Pepco's distribution grid to support full electrification, in line with the District's climate goals and roadmap.

On August 27, 2021, Pepco filed with the DC Public Service Commission a study analyzing the load impacts of electrification on its Washington, D.C system.[1] That study, conducted by The Brattle Group, focused on system load growth rates and the role that grid flexibility could play in mitigating load growth.

Subsequently, on October 10, 2024, the DC Public Service Commission issued Order 22313[2] directing Pepco to develop an updated electrification study. According to the Order:

> *"The updated electrification study should have sufficient detail, granularity, and explanation of capital expenditures needed to bolster the electric grid for full electrification. Pepco's updated electrification study must [include] granular energy efficiency and load flexibility impacts that indicate energy and load reductions, as a result of the revised CSP or revised CBP, and the new 15-Year Plans. The 15-Year Plan and electrification study must also provide detailed analyses regarding load-shifting projections, any capital investments, and behind-the-meter equipment investments (including end-use equipment, wiring, panel upgrades, etc.) necessary to support a winter peaking system."*

The purpose of this study is to address the Commission's request for an updated electrification study by assessing the impacts of the District's electrification goals on the loading of Pepco's electric distribution system – consisting of 827 feeders and 45 substations – and identifying the cost of potential grid upgrade needs, with and without grid flexibility. Our analysis considers load growth and distribution investments needs through 2040.

What is Grid Flexibility?

In this study, we use the term "grid flexibility" to include distributed energy resources, energy efficiency, and demand flexibility technologies that could potentially be used to mitigate grid upgrades.

The study refers to these technologies collectively as "grid flexibility technologies", and grid flexibility is defined as the ability to shift/reduce demand or supply to meet grid needs.

The technologies included in our analysis are indicative of the types of programs that are or could be introduced as part of Pepco's Climate Solutions plan. We have analyzed long-run deployment/adoption scenarios that extend beyond the scale include in Pepco's near-term plans.

1 An Assessment of the Impacts of Electrification on the Pepco DC System
2 Order 22313, Case Number 1167

Interpreting the Findings

This study should not be considered a substitute for detailed distribution system planning.

Focus on load growth. The study focuses specifically on distribution capacity expansion investment needs driven by load growth. Other needs, such as grid modernization or replacement of aging equipment, are outside the scope of this study.

Not a distribution system investment plan. While this study provides feeder-level granularity, it is not a substitute for detailed distribution system planning and is not intended to inform the need for investing in specific projects. Our study uses average feeder and substation project costs to estimate the investment needed to mitigate projected overloads. More detailed solution scoping may identify additional asset-specific issues, alternative solutions, and refined cost estimates for each specific grid need.

Grid flexibility distribution value, not cost-effectiveness. The study illustrates the distribution grid investments that may be deferred through the deployment of grid flexibility technologies. It does not assess value to the bulk system and does not include the cost of deployment of these technologies. Detailed benefit-cost assessments should be done in the context of specific programs or distribution upgrade deferral opportunities.

Policy-based assumptions. The study assumes high electrification levels in 2040 in order to conduct the grid needs assessment. It is not a forecast of electrification or adoption of certain technologies by customers.

Additional Distribution System Planning Considerations

In addition to the load shape and grid flexibility technology-related considerations described throughout this report, there are several important engineering and economic considerations that must be studied before selecting grid flexibility as the solution to mitigate a grid need. These include:

- Contingency analysis and potential upgrades that cannot be avoided due to needs in N-1 conditions
- Minimum loading conditions and potential distributed generation hosting capacity constraints
- Load flow studies to inform voltage stability and other power quality metrics
- IT and OT capabilities needed to enable the operational visibility and locational control of grid flexibility technologies in response to locational grid needs
- Sufficiency of grid flexibility technology potential in the specific location (e.g., based on customer types, saturation of end use technologies, availability of physical space for siting solar/storage)
- Cost of DER deployment relative to the grid upgrade that would be scoped for the specific grid need

3. Methodology Overview

Study Scenarios

The study evaluates distribution grid needs in three scenarios designed to provide insights into grid upgrades that could be driven by electrification, and the value grid flexibility could provide by mitigating some of the grid needs.

SCENARIO	SCENARIO DESCRIPTION	SCENARIO PURPOSE
No Additional Electrification, No Additional Grid Flexibility	This scenario holds the current (i.e., 2024) fuel mix for transportation and buildings constant through 2040 and assumes no additional DERs, energy efficiency, or demand flexibility.	Serves as the status quo baseline relative to which impacts of electrification and grid flexibility can be evaluated
Full Electrification, No Additional Grid Flexibility	This scenario assumes a 2040 fuel mix for transportation and buildings consistent with the decarbonization strategies enumerated in various District's climate initiatives.	Allows estimation of grid needs to support the District's electrification goals Serves as the basis for evaluating the potential value of grid flexibility to the distribution grid
Full Electrification with Achievable Grid Flexibility	This scenario assumes three plausible levels of deployment of grid flexibility technologies – i.e., DER, energy efficiency, and demand flexibility – by 2040.	Allows estimation of the value of mitigating grid needs using grid flexibility Highlights the relative value of various individual grid flexibility technologies

Detailed assumptions on technology penetration and capabilities in each scenario are provided in the Appendix Report.

Analytical Approach

The analytical approach for this study consists of three interrelated steps.

1

Develop a Demand Projection

- Gather 2024 hourly load for each feeder and substation to serve as baseline
- Grow non-electrification loads based on Pepco's feeder-level forecast
- Adjust loads to reflect Pepco's planned load transfers
- Model hourly demand for each electrification technology for each customer type (residential and commercial)
- Add electrification loads to each feeder based on feeder-specific customer types and counts and assumed technology penetration in the scenario

2

Model Grid Buildout

- Identify overloads based on asset rated capacity and projected hourly load in 2040
- Identify the solution set allowable in each location based on rules-of-thumb for each asset type and space constraints by ward
- Assess allowable solutions and select the lowest cost upgrade/build that would resolve the overload

3

Assess Grid Flexibility Options

- Model changes to the load shape based on the set of non-dispatchable technologies deployed at the asset
- Optimize dispatch of the demand flexibility technologies to reduce the asset's peak load
- Estimate the battery capacity that would be required to mitigate any remaining overloads and consider feasibility
- Conduct sensitivities on technology deployment levels
- Reassess grid buildout needed after accounting for grid flexibility
- *Note: Deployment costs are not factored into this approach*

A detailed description of the methodology is provided in the Appendix Report.

4. The Impacts of Electrification

Baseline: No Electrification, No Grid Flexibility Scenario

In the absence of additional electrification and grid flexibility, Pepco's system peak load is projected to grow 26% by 2040, requiring $665 million in capacity expansion investments.

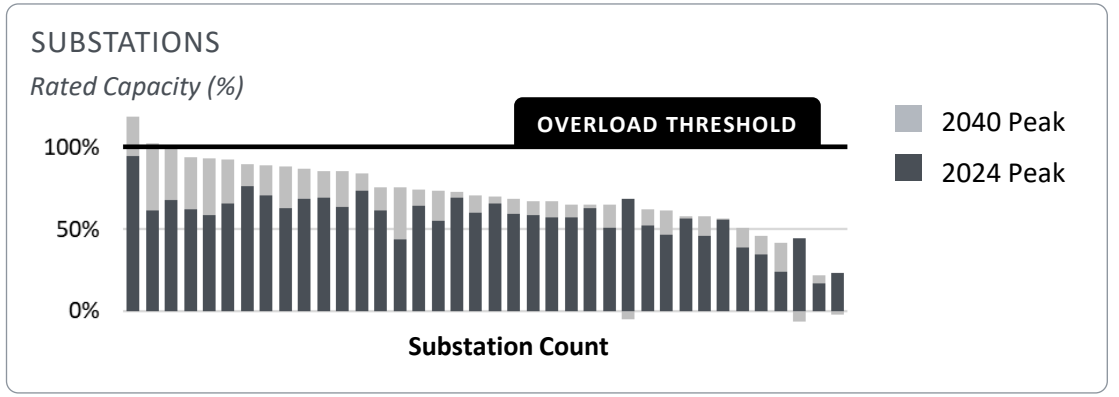
Pepco DC system peak demand grows by 557 MW (26% growth relative to 2024) by 2040 in the No Electrification, No Grid Flexibility Scenario. This is driven primarily by forecasted growth of the residential customer count by 48% and commercial customer count by 3%.

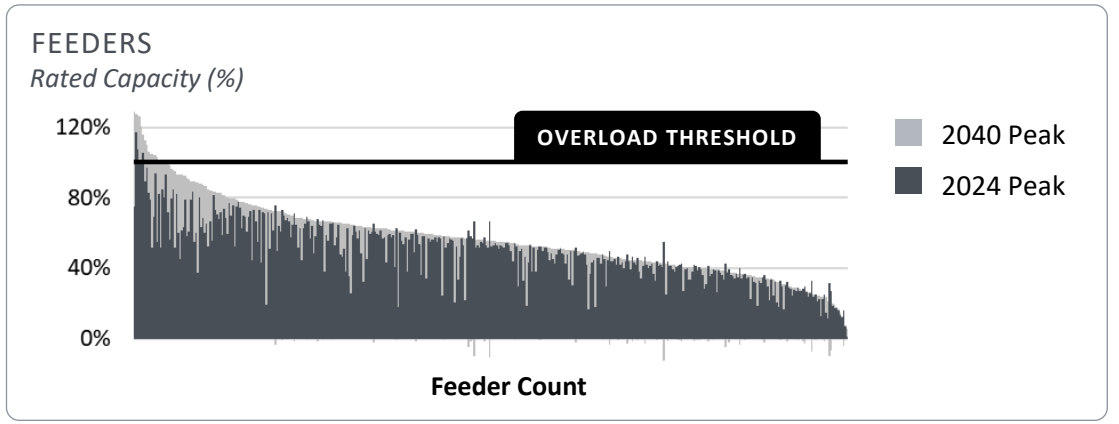
Approximately $665 million in capacity expansion investment is needed to support this Baseline load growth. Pepco's distribution system planning process identifies and plans for capacity needs through 2034. This study's No Electrification Scenario includes those already-planned upgrades and adds additional upgrades for needs through 2040. Total estimated capex is $665 million or $44 million/year for the 15-year period from 2025 to 2040[1]. All costs figures in this report are in real 2025 dollars.

Pepco's feeders and substations have significant hosting capacity for load growth, especially in the winter. Due to over a decade of stagnant demand growth, most parts of Pepco's distribution system experience summer peak loads that are less than 75% of rated feeder/substation capacity. Due to the limited amount of electrified heating currently used in the District, winter peaks are significantly lower than summer peaks in most locations, meaning there is even more room for winter load growth.

1 In order to align with the methodology used in this study for the other scenarios, we estimate the capex for Pepco's already-planned projects using the same generalized rules of thumb for feeder and substation projects costs, rather than project-specific costs. Therefore, the capex shown for this scenario is unlikely to match the figures in any of Pepco's distribution system planning filings; 2 Overload thresholds for all modeled distribution components include the capacity increases already in Pepco's existing capacity expansion plan.

PROJECTED OVERLOADS BY 2040 – NO ADDITIONAL ELECTRIFICATION SCENARIO[2]





Electric Load Growth Drivers Under The District's Climate Roadmap

Electrification is a cornerstone of the District's climate goals.

The District's Carbon Free DC strategy identifies the key actions needed to reach carbon neutrality by 2045. A significant part of the strategy is electrification of the District's transportation and building sectors, with specific goals outlined for certain technologies and a target for minimal residual fossil fuel use in 2045. We analyzed these targets to develop the 2040 electrification levels assumed in this study, as outlined in the table.

Apart from electrification, Pepco's load growth is expected to be driven primarily by residential customer growth. Over the next 15 years. Pepco forecasts the residential customer base to increase nearly 50%, while commercial growth remains roughly flat. Today, the Pepco system is heavily commercial with almost 80% of demand coming from commercial customers.

KEY SCENARIO ASSUMPTIONS DRIVING LOAD GROWTH

		Current (2024)	2040
Customer Count	Residential	318k	470k (+48%)
	Commercial	28.0k	28.9k (+3%)
Electric Space Heating	Residential	41%	90%
	Commercial	50%	90%
Electric Water Heating	Residential	52%	90%
	Commercial	73%	90%
Electric Vehicles	LDV	2.5%	73%
	MDV	0%	80%
	Bus	0.5%	90%
	HDV	0%	10%

Sources and notes: Customer count forecast is from Pepco's latest load forecast. 2024 baselines are calibrated based on data from NREL ResStock and ComStock, EIA RECS and CBECS, and Federal Highway Administration Statistics. 2040 penetration assumptions for electrified technologies are developed based on various District climate initiatives (see pg. 9). 2024 and 2040 percentages refer to the portion of customers served by each technology.

Peak Demand Impacts of Electrification

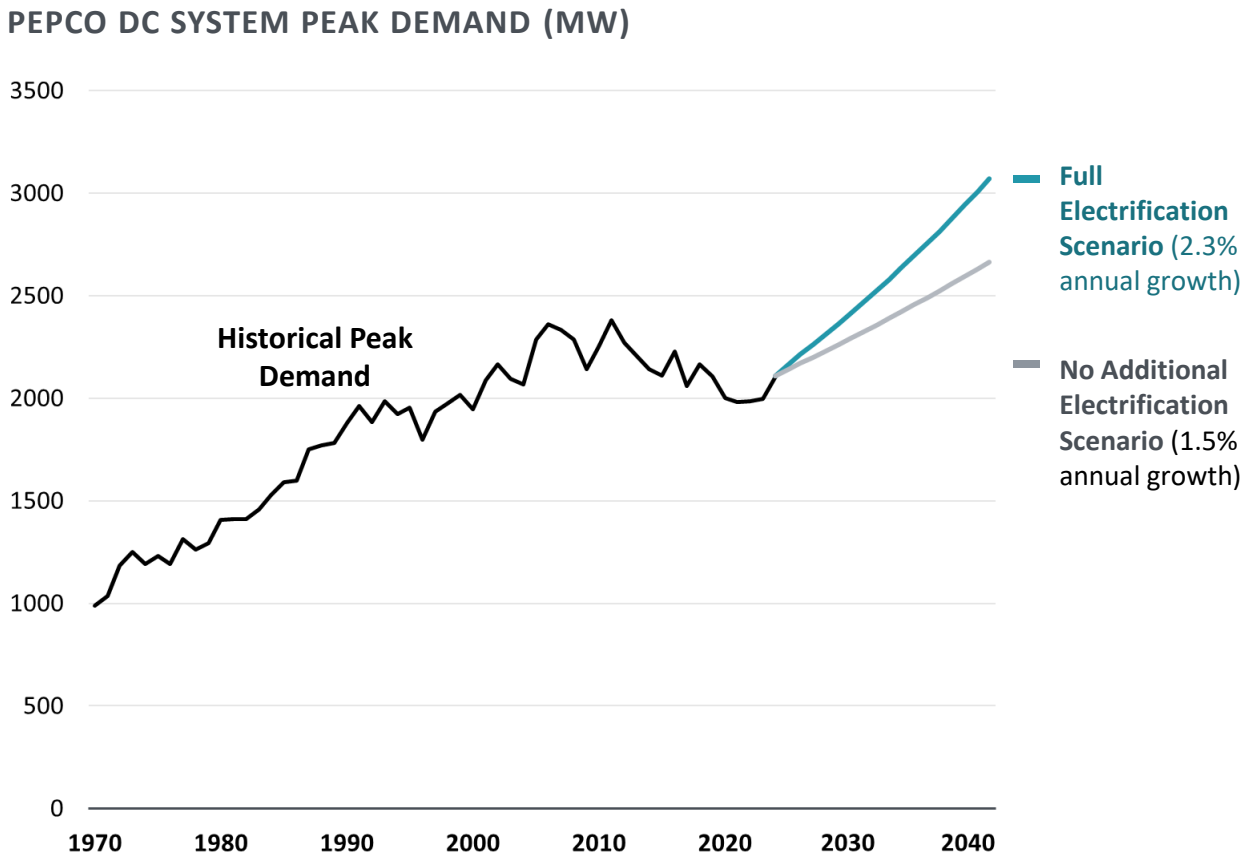
Achieving the District's electrification goals would lead to significantly higher demand growth on Pepco's system.

Pepco DC system peak demand grows by 1,097 MW (52% growth relative to 2024) by 2040 in the Full Electrification, No Grid Flexibility Scenario. This is 540 MW more growth than without electrification, i.e., electrification roughly doubles the projected growth. Growth is driven primarily by peak electric heating loads, which occur on cold winter mornings.

Pepco DC as a whole becomes winter-peaking. Relative to 2024 seasonal peaks, the winter peak grows 61% while the summer peak grows 41%, with electric heating driving the winter growth. Transportation electrification contributes to summer load growth but is a limited contributor to winter peaks because typical vehicle charging schedules are not very coincident with the morning heating peak.

Consistent with Pepco's 2021 Electrification Study[1], though electrification significantly increases load growth, growth rates are within historically observed ranges. Historically, Pepco experienced high load growth rates of 4.5% per year from 1970-1990, driven by the adoption of air conditioning, among other drivers. The projected load growth rate in the Full Electrification Scenario is 2.3% per year through 2040, well under the highest historical growth rates. In addition, future load growth rates can be mitigated to an extent by deploying grid flexibility measures, as discussed later in this report.

1 An Assessment of Electrification Impacts on the Pepco DC System; *2 PHI Statistical Loadbook*



Note: 2040 is the only year modeled in the study. A trajectory between 2024 and 2040 is shown based on the implied annual average load growth rate for illustrative purposes.

Distribution Grid Needs to Support Electrification

Several feeder and substation upgrades will be needed to support load growth in the Full Electrification Scenario, causing Pepco's capacity expansion capex to more than double relative to the scenario without electrification.

Required Incremental Grid Investments *(in 2025 dollars)*
Full Electrification, No Grid Flexibility Scenario

Feeders:

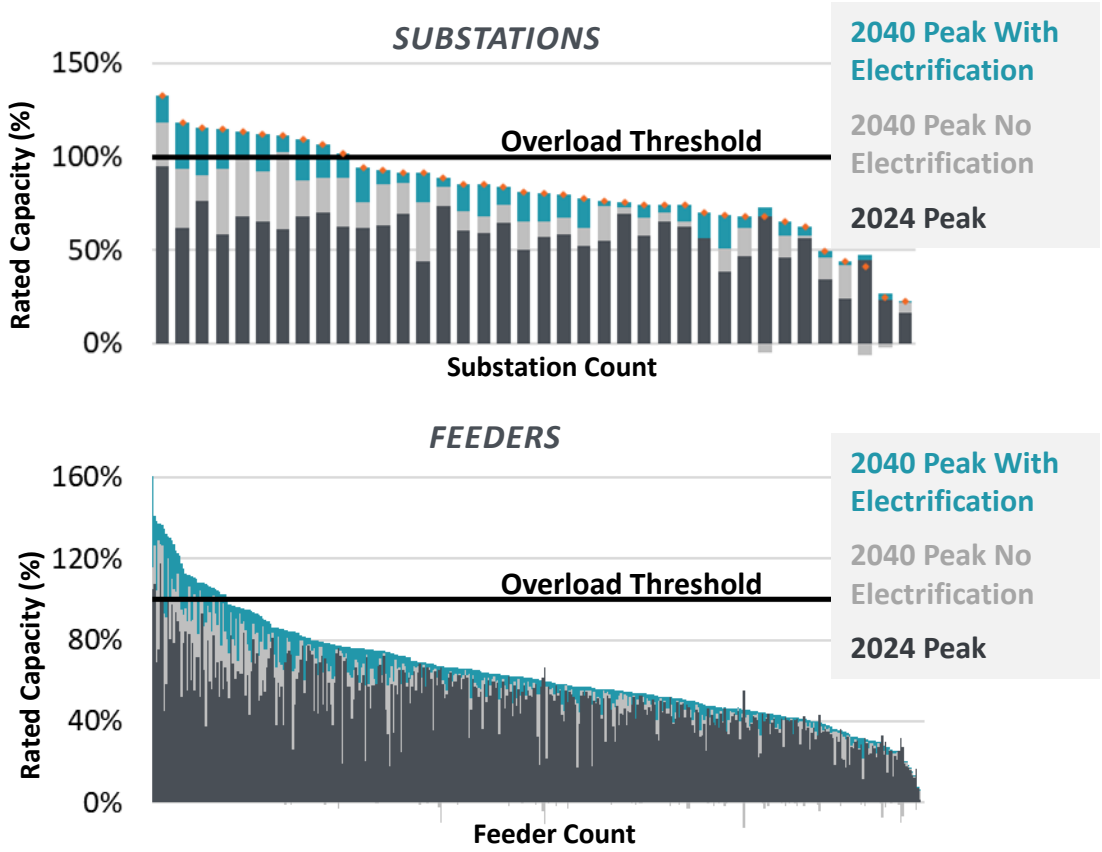
- 26 new 13 kV feeders: $286 million
- 3 feeder conversions from 4kV to 13kV: $18.6 million
- Total capex: $305 million

Substations:

- 2 new substation builds: $588 million
- 3 new transformer banks at existing substations: $24 million
- 2 4kV substation overloads resulting in feeder conversions: $12.4 million
- Total capex: $624.4 million

Total: $929 million incremental capex on top of the $665 million in the No Additional Electrification Scenario

PROJECTED OVERLOADS BY 2040 –
FULL ELECTRIFICATION, NO ADDITIONAL GRID FLEXIBILITY



Notes: Some substations/feeders have a negative component to their load growth to indicate Pepco's planned load transfers. These components show up as negative growth for one component and positive growth for another. The orange points represent net total loading of each component after accounting for both load growth and transfers.

5. The Potential Role of Grid Flexibility

Grid Flexibility Technologies: Potential Alternatives to Grid Upgrades

The study considers several grid flexibility measures which, under the right conditions, could be an alternative to traditional distribution system investment.

MODELED GRID FLEXIBILITY TECHNOLOGIES AND SUITABILITY AS A SOLUTION FOR DISTRIBUTION GRID NEEDS

	Technology	Assumed Deployment Rates	Modeled Operation	Suitability as a Solution For Distribution Grid Needs
Distributed Generation	**BTM Solar**	*Low:* Supplies 4% of energy *Mid:* Supplies 7.5% of energy *High:* Supplies 15% of energy	Based on a representative hourly solar profile for the Washington, D.C. area.	Solar, as a non-dispatchable resource, can serve to reduce loading on the grid if needs are consistently coincident with times of high solar generation.
	Batteries	*Low:* 0.3 MW *Mid:* 9.6 MW *High:* 16 MW	4-hour duration assets, with 85% round-trip efficiency. Dispatch is assumed to be grid-aware, i.e., optimized to reduce feeder/substation peaks.	Deployment can be either BTM or FTM, and operation can be highly targeted, flexible, and controllable. Batteries can fill gaps in the grid flexibility portfolio as needed to mitigate the grid need.
Energy Efficiency	**Weatherization**	*Low:* 5% of buildings *Mid:* 10% of buildings *High:* 20% of buildings	Refers to building envelope upgrades that are assumed to result in a 10% reduction in the building's heating demand across all hours.	Because many of the grid needs in the Full Electrification Scenario are driven by heating peaks, efficiency measures that reduce heating energy needs can be highly effective and targeted solutions even though they are non-dispatchable. Their impacts are also not duration-limited, unlike batteries and demand flexibility technologies.
	Cold Climate Heat Pumps (ccASHPs)	*Low:* 12.5% of heat pumps *Mid:* 25% of heat pumps *High:* 50% of heat pumps	Supplemental auxiliary resistive heating below 32F. Customers with ccASHPs are assumed not to need resistive heating, so their COPs are slightly higher in the coldest hours.	
Demand Flexibility	**Heating Load Control**	*Low:* 5% of customers *Mid:* 12.5% of customers *High:* 25% of customers	3-hour event, 20-40% of heating load during events is shifted into the prior two and following three hours, up to 15 events.	Heating load control with heat pumps is in the early stages of deployment but could be useful to call on for a very limited number of events to target the most constrained hours.
	EV Managed Charging	*Low:* 12.5% of LDV EVs *Mid:* 25% of LDV EVs *High:* 50% of LDV EVs	Modified average charging load shape. More charging occurring overnight rather than during the evening peak hours.	High impact in locations that remain summer peaking and require load shifting in the evening hours.

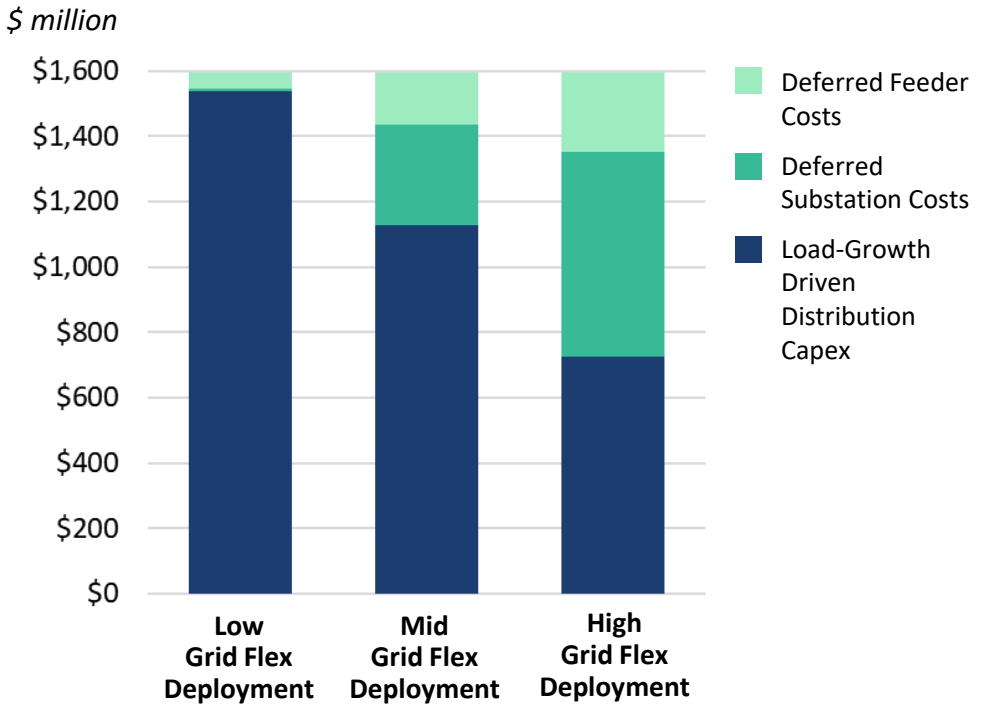
Reduced Grid Needs Through Grid Flexibility

Deploying a portfolio of grid flexibility technologies could reduce the 2025-2040 capex requirement by $58-$868 million (a 4%-54% reduction). However, the costs of deploying the grid flexibility measures are not included in this analysis and should be studied for cost-effectiveness relative to traditional grid upgrades.

The results highlight that the ability of grid flexibility to defer distribution system investment depends heavily on reaching sufficient levels of grid flexibility adoption. Further, once the largest deferral opportunities are achieved, the incremental value of additional reductions declines. Investment decisions are highly project-specific and each will need to consider the relative cost of grid flexibility, which is not included in this study.

Grid Flex Case	Description	Upgrade Deferral Outcomes
Low Deployment	Representative of meaningful current-day adoption of grid flexibility programs, but with very limited increase in localized solar generation	Several new feeders are avoided, one substation upgrade avoided
Mid Deployment	Represents 2040 adoption levels of 10%-25%, depending on the technology	Many new feeders are avoided, and one high-cost substation build is avoided
High Deployment	Represents 2040 adoption levels nearing the upper limits of the modeled sample technologies' maximum achievable adoption, with levels between 20%-50%	Most electrification-driven new feeders and many substation upgrades are avoided

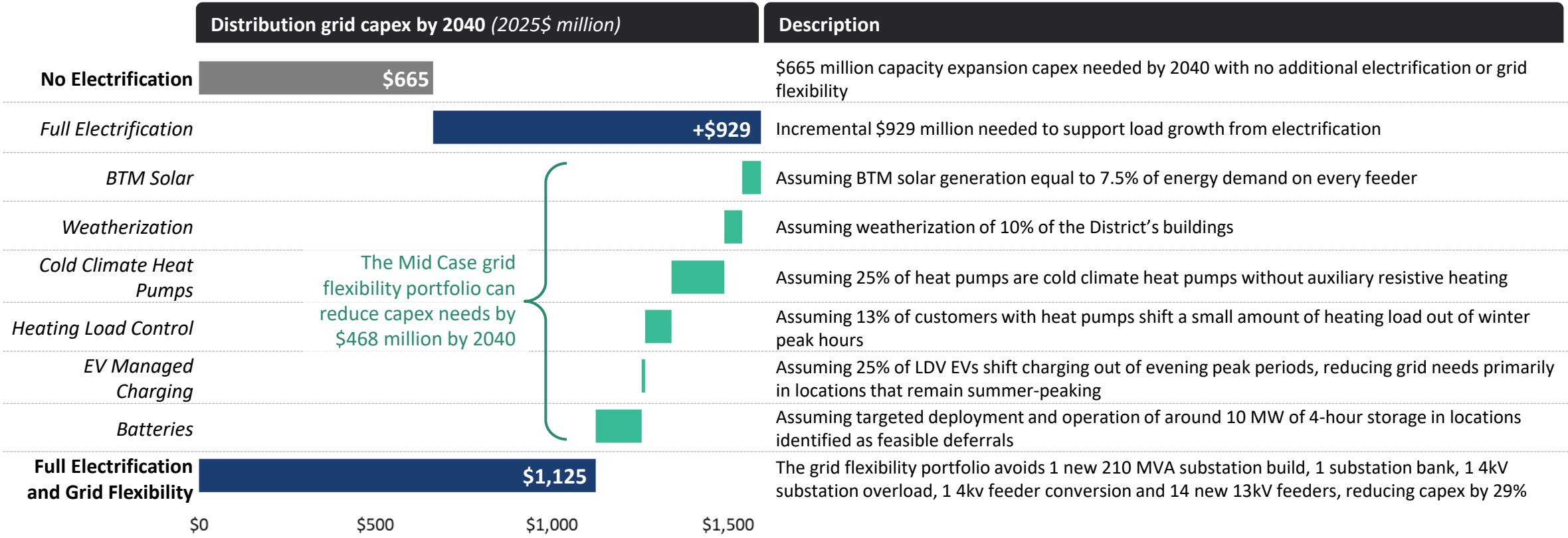
2025-2040 DISTRIBUTION CAPEX REQUIREMENT WITH VARYING DEPLOYMENT OF GRID FLEXIBILITY TECHNOLOGIES



Technology-Specific Contributions: Mid Case Illustration

Each component of the grid flexibility portfolio can contribute to a reduction in grid needs. The relative contributions will vary due to differing deployment levels and technology performance characteristics.

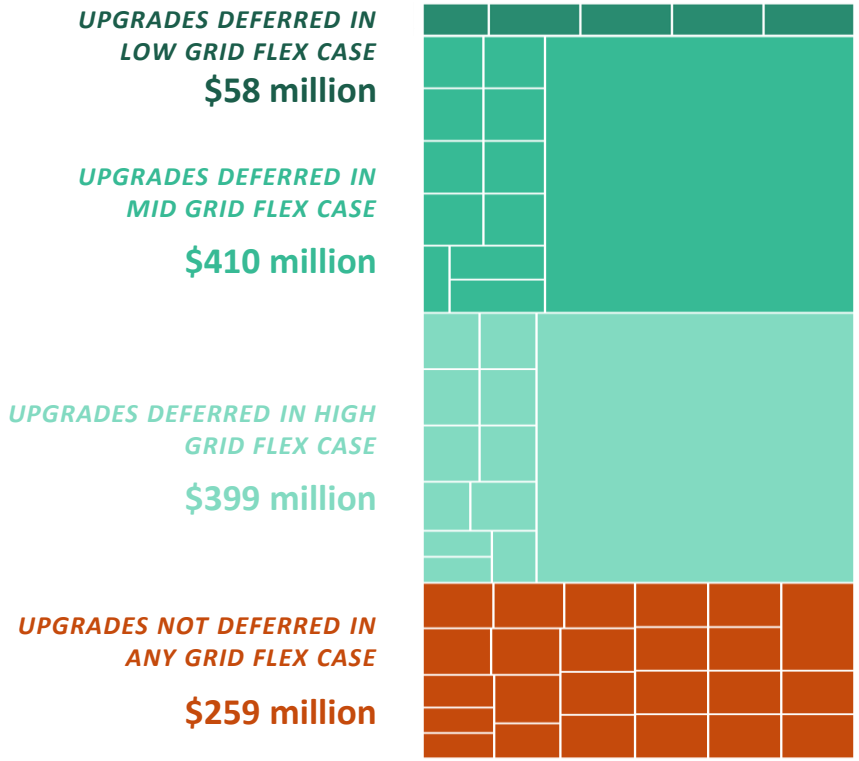
ILLUSTRATIVE REDUCTION OF GRID NEEDS THROUGH A PORTFOLIO OF GRID FLEXIBILITY TECHNOLOGIES (MID-DEPLOYMENT CASE)



Characteristics of Deferral Opportunities

Grid flexibility is unlikely to be a feasible solution for all grid upgrade needs. The most feasible candidates for investment deferral will have low load growth rates, a modest forecasted level of overload, and a limited duration (i.e., hours) of overload.

GRID NEEDS – FULL ELECTRIFICATION SCENARIO
EACH BOX IS ONE UPGRADE; BOX SIZE IS PROPORTIONAL TO UPGRADE COST

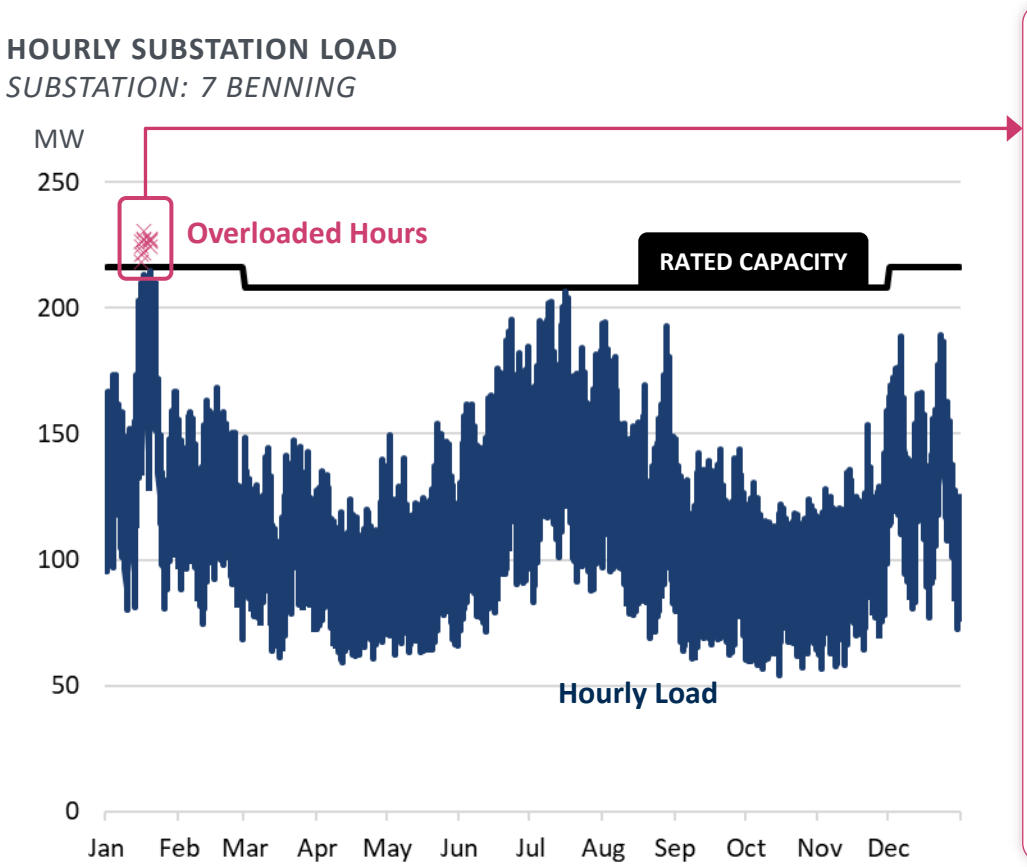


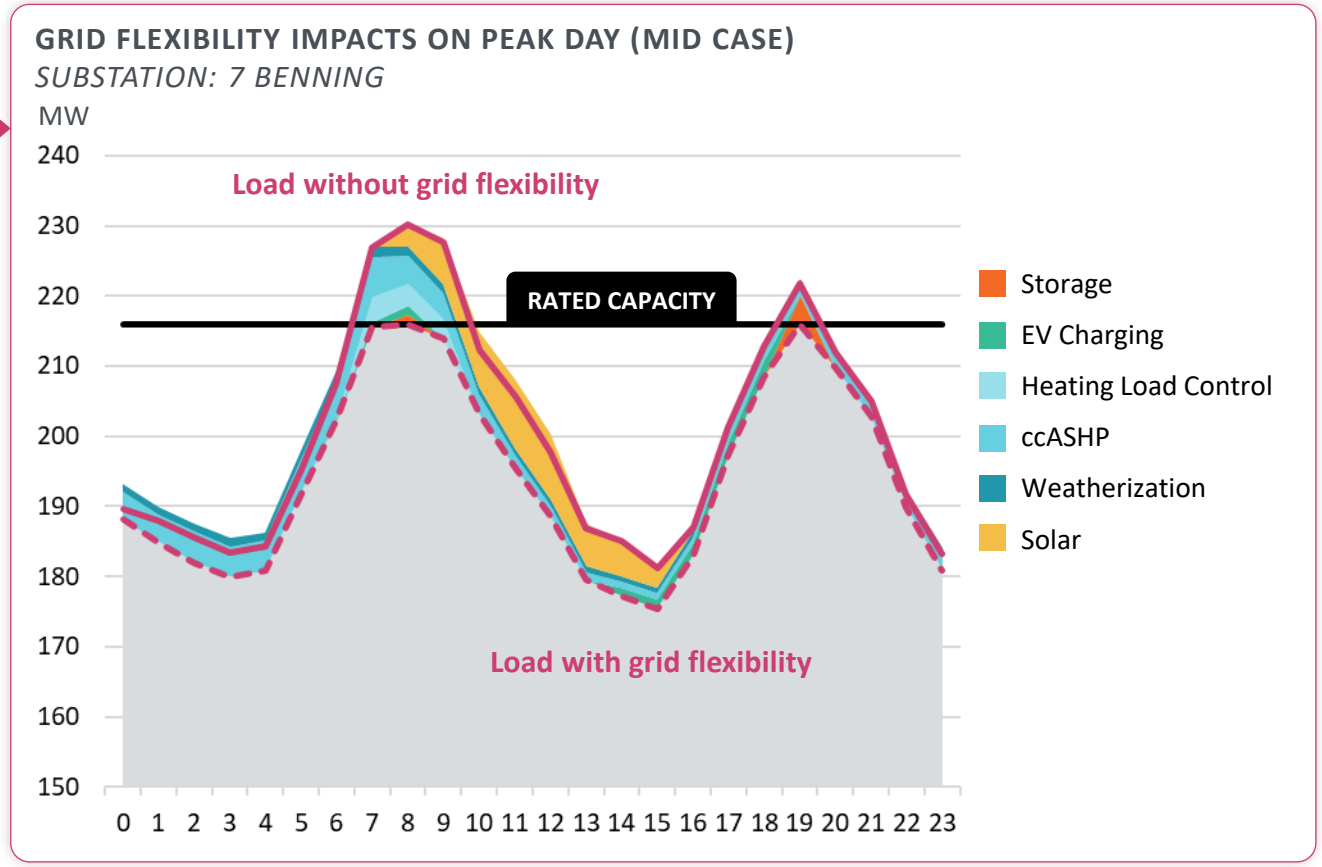
DISTRIBUTION ASSET CHARACTERISTICS RELATED TO DEFERRAL FEASIBILITY

Upgrade Deferral Status	Load Growth Rate	Magnitude of Overload	Duration of Overload	Frequency of Overload
Deferred in Low Grid Flex Case	2.4%-5.4%	0.8%-4.6%	2-3 hours/day	1-2 days/year
Deferred in Mid Grid Flex Case	3.1%-7.0%	3.8%-9.0%	2-5 hours/day	1-6 days/year
Deferred in High Grid Flex Case	2.6%-6.1%	6.7%-18.5%	4-9 hours/day	1-14 days/year
Not Deferred in Any Grid Flex Case	2.1%-7.4%	8.1%-68.6%	1-24 hours/day	2-365 days/year
Takeaway	Assets facing rapid load growth are less likely to be feasible candidates.	Assets facing larger overloads are less likely to be feasible candidates.	Assets facing frequent overloads for longer periods are less likely to be feasible candidates.	

Operational Feasibility: Waterfront Substation Example

The figures below illustrate how the portfolio of grid flexibility technologies could mitigate the projected overload at the Benning Substation, avoiding the need for a new substation that could cost around $300 million.





Note: As discussed throughout this report, the analysis of this investment deferral opportunity does not consider the cost of grid flexibility relative to the cost of building the new substation. It is only an illustration of operational feasibility under assumed future adoption levels.

6. Additional Considerations

Pepco DC in the context of other utilities

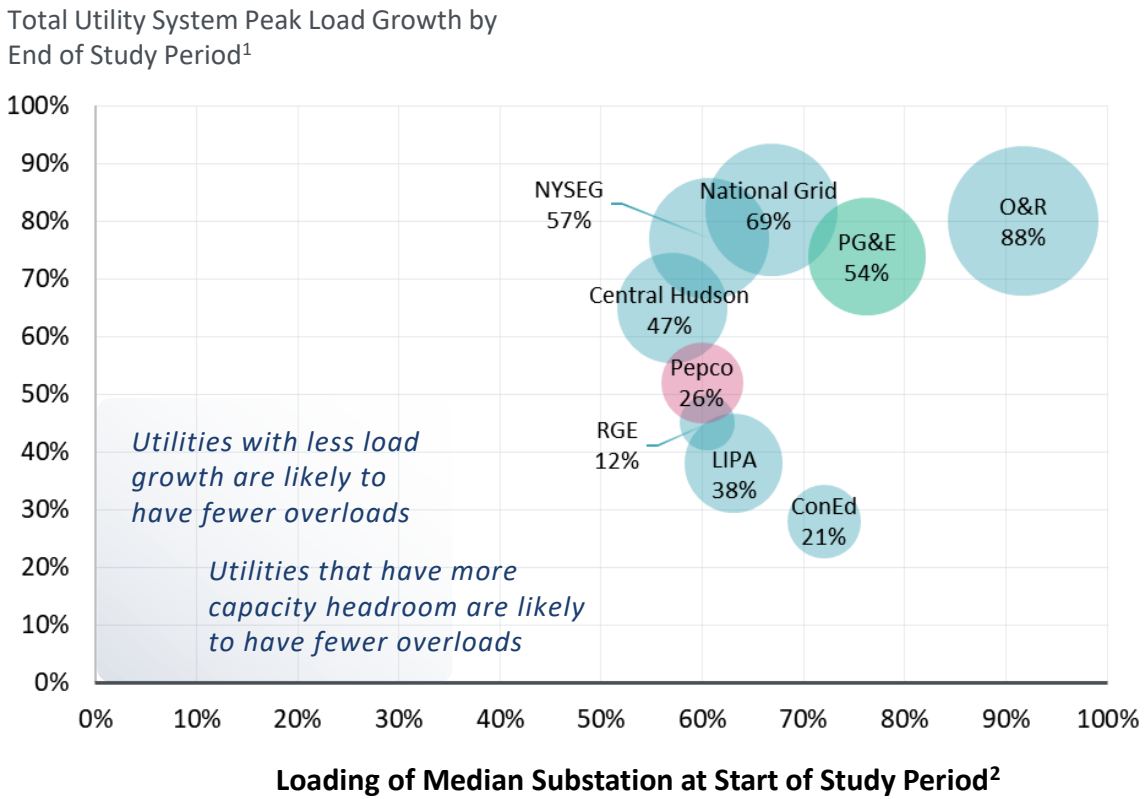
The portion of Pepco's distribution system requiring upgrades is modest compared to some other jurisdictions with deep electrification goals.

Benchmarking against two recent studies – New York's Grid Flexibility Potential Study and California's Electrification Impact Study – show that our results for Pepco fall within the range of results observed in these two studies. As the wide range of results (12%-88% of substations overloaded across utilities) shows, electrification impacts are highly utility-specific. Two important utility-specific drivers may explain some of the variation in results:

- **Average existing capacity headroom** on the system varies widely across utilities. Utilities with less headroom are likely to face more overloads, all else equal. Pepco's results are similar to Con Edison, which has a similarly large urban service territory and a networked distribution system.
- **Load growth rates** vary widely across utilities. Utilities with more load growth are likely to face more overloads, all else equal. The 52% system peak load growth for Pepco in the Full Electrification Scenario is within the 28-85% load growth range for the New York utilities in a high electrification scenario, with higher growth rates potentially being due to the colder climate in upstate New York.

COMPARISON WITH FINDINGS FROM RECENT STUDIES IN CALIFORNIA AND NEW YORK

BUBBLE SIZE INDICATES % OF OVERLOADED SUBSTATIONS



Sources: New York's Grid Flexibility Potential Study, The Brattle Group; CPUC Electrification Impact Study, Kevala
Notes: 1 End of study period is 2035 for the CPUC Electrification Impact Study and 2040 for the NY Grid Flexibility Study and the Pepco Electrification Impact Study (this study). 2 Start of study period is 2023 for the NY Grid Flexibility Study and 2024 for the Pepco Electrification Impact Study. Because loading at the start of the study is not available from the CPUC study report, the chart shows 2025 median loading from each California IOU's hosting capacity map.

Comparing this Study's Findings to Related Studies

Prior studies of electrification load growth and the impact on the distribution system show similar findings, highlighting Pepco's substantial headroom in winter months and the resulting moderate impact of electrification.

Pepco – An Assessment of Electrification Impacts on the Pepco DC System (August 2021) – *Link to study*

The original version of Pepco's electrification study, filed with the Commission in 2021, assessed the magnitude of load growth that could be expected due to full electrification.

SIMILAR TAKEAWAYS

- Pepco's system would remain within observed historical rates of load growth, even with full electrification by 2050.
- Pepco's system would become winter-peaking due to electrified heating loads.
- Energy efficiency and demand flexibility could reduce annual load growth rates significantly.

STUDY FRAMEWORK DIFFERENCES

Granularity: The 2021 study assessed electrification impacts on peak load at the Pepco system level, while the 2025 study assesses impacts at the feeder and substation level.

Costs: The 2021 study did not quantify the costs of supporting the estimated load growth. The 2025 study estimates capacity expansion capex through 2040.

Time horizon: The 2021 study focused on 2050, while the 2025 study focuses on 2040.

Scenario design: The 2021 study used a Reference case based on PJM's load forecast for the Pepco zone. The 2025 study developed its own "No Additional Electrification" baseline scenario, building on top of Pepco's feeder-level load forecasts, which are used for distribution system planning.

Policy changes: While both studies assume full/near-full electrification, the 2025 study incorporates goals from various District climate initiatives adopted after publication of the 2021 study.

DOEE – Strategic Electrification Roadmap for Buildings and Transportation (April 2023) – *Link to study*

The DOEE electrification study estimated electrification load impacts, identified a small number of required grid upgrades, and evaluated non-wire alternatives to mitigate grid needs.

SIMILAR TAKEAWAYS

- Pepco's system has significant winter capacity headroom, which moderates electrification-driven grid needs.
- The substations flagged in DOEE's study as approaching capacity by 2032 are some of those flagged in this study as being overloaded by 2040.
- Grid flexibility/non-wire alternatives are a feasible solution to meet some of the identified grid needs. Cost-effectiveness should be studied case-by-case.

STUDY FRAMEWORK DIFFERENCES

Granularity: The DOEE study had similar feeder/substation level granularity but focused on a subset of Pepco's feeders, not Pepco's entire system.

Costs: While both studies estimated capex costs, the cost estimated in the DOEE study was much lower primarily due to the difference in time horizon.

Time horizon: The DOEE study focused on 2032, while the 2025 Pepco study focuses on 2040.

Scenario design: The DOEE study assumes a much lower level of electrification, also driven by the difference in time horizons.

Additional electrification costs and benefits

Separate from Pepco's investment in distribution system capacity expansion, achieving the District's decarbonization goals through electrification will include other costs and associated benefits.

Secondary Distribution System Upgrades

The secondary distribution system extends from the utility's higher voltage primary system to the customer's meter; it includes the secondary transformer and the service line to the customer's premise. The secondary system is generally not part of the distribution capacity planning process; it is upgraded/replaced at the point of predicted asset failure or when customers apply for a larger service that would overload the existing system.

Many customers may require upgrades to their service to support their EV charging and heat pump demands. As multiple customers in a neighborhood electrify, secondary transformers, which serve small groups of customers, are also likely need upgrades to serve higher coincident peaks across their group of customers.

Incremental costs to upgrade the secondary system are likely to depend on the current age of the system and planned standards for routine replacement (e.g., making all replacement transformers electrification-ready now may have a lower cost than upgrades at the time of customer load request). In addition, there are emerging solutions for granular load shaping to avoid local distribution system overloads. Examples of such solutions include smart panels, meter-socket-adapters, and grid-aware active management of EV charging.

Due to the location-specificity of these needs, most electrification studies do not attempt to estimate the system-wide costs or timing of electrification-driven secondary system upgrades. One point of reference for the potential order of magnitude of these costs is Kevala's Electrification Impact Study for the CPUC. It found that secondary transformer upgrades could comprise about 30% of total distribution grid upgrade costs in a high electrification scenario.

Heating Appliances and Building Upgrades

As an approximate indicative value, we estimate that the modeled full electrification scenario involves net incremental expenditures of $1.2 billion on space and water heating appliances from 2025 to 2040. This is based on an estimated cost of $4.3 billion for new electric appliances and avoided costs of $3.1 billion for fossil fuel appliance replacement. There may be additional avoided costs of replacing cooling appliances as heat pumps can provide both heating and cooling.

Some buildings may require upgrades to their heating distribution systems, electrical panels, or wiring when electrifying. These costs are highly building-specific and should be evaluated at the time of upgrade.

These are not utility costs, so they would be borne by the electrifying customer (with offsetting incentives where applicable) and not by Pepco ratepayers as part of utility rates.

Avoided Fossil Fuel Costs

Electrifying customers would avoid the cost of fossil fuel purchases and any associated delivery or infrastructure costs. The costs and benefits of specific electrification technologies have been extensively studied in the District and elsewhere, so we do not attempt to estimate these benefits in this study.

7. Conclusion

Key Findings

The Pepco DC system currently has significant capacity headroom for load growth, especially in the winter. Most parts of the system can support electrification loads through 2040 without additional upgrades. However, the areas requiring upgrades due to electrification will increase the total investment need relative to recent levels.

Without grid flexibility, meeting the District's electrification goals could more than double Pepco's capacity expansion expenditures by 2040. Pepco's capacity expansion needs from 2025-2040 are estimated to cost $665 million in a scenario with no additional electrification and $1,594 in a scenario with full electrification and no grid flexibility.

Grid flexibility technologies could be a feasible solution to reduce capacity expansion expenditures. A portfolio of grid flexibility technologies - rooftop solar, batteries, weatherization, cold climate heat pumps, managed EV charging, and smart thermostats – could reduce the required capex by $58 to $868 million (4% to 54%). However, this result does not account for the cost of the grid flexibility measures; more granular cost-effectiveness analysis is an important next step.

There is significant value in targeted deployment of grid flexibility in areas where grid capacity expansion would be particularly expensive. The grid capacity expansion solutions to mitigate overloads have a wide range of costs. Grid flexibility is shown to be particularly valuable to deploy in locations where the most expensive capacity expansion projects may be needed, and where overload conditions are limited in terms of duration, magnitude, and rate of growth.

Scale is essential to achieve grid flexibility value. The distribution value of grid flexibility is highly dependent on deployment reaching significant scale in the locations where it is needed most; moderate levels of deployment are unlikely to produce meaningful distribution benefits.

Cold climate heat pumps are a particularly valuable grid flexibility technology. The efficiency-related savings of cold-climate heat pumps (relative to heat pumps with auxiliary resistive heating) tend to be coincident with the winter peak and can be a major contributor to grid flexibility portfolios that defer the need for grid upgrades.

Batteries provide unique value to the grid flexibility portfolio. Batteries are flexible from both an operational and siting perspective, with the option to take advantage of efficiencies by them at the customer's premise or to attach them to the distribution system where needed most. Batteries can act as the "glue" that enables the rest of the grid flexibility portfolio to provide benefits.

Next steps

We recommend several next steps for acting on the findings in this study.

Cost-effectiveness analysis: A comprehensive assessment of the benefits and costs of grid flexibility will identify the most valuable opportunities and limitations of this resource. Such an analysis should account for additional benefits that grid flexibility can provide beyond distribution value.

Barriers assessment: A range of regulatory, technical, and market barriers may prevent grid flexibility from being achieved at the levels assumed in this study. An assessment of those barriers in the District – and options for overcoming them – will provide a guide for maximizing the potential.

Utility investment needs roadmap: Investments such as DERMS systems may be needed to enable grid flexibility benefits. A roadmap that identifies key utility capability gaps and options for mitigating them will ensure that the underlying infrastructure is in place to enable the opportunity.

Timing/scale assessment: This study focused on a 2040 end state and assumed full achievement of District policy goals. Analysis of the technology adoption trajectory to 2040 - as well as uncertainty in that trajectory - will be important to ensure robust strategies across a range of possible future outcomes.

Further Reading on Electrification and Grid Flexibility

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For Further Information

Ryan Hledik

PRINCIPAL | SAN FRANCISCO

Ryan.Hledik@brattle.com

Ryan focuses his consulting practice on regulatory, planning, and strategy matters related to emerging energy technologies and policies. His work on the grid edge has been cited in federal and state regulatory decisions, and featured by *Forbes*, *National Geographic*, *The New York Times*, *NPR*, *PBS News Hour* and *The Washington Post*. He has published more than 30 articles on electricity matters, presented at industry events in 11 countries, given lectures on distributed grid economics at Penn, Stanford, and Yale, and served on the advisory boards of a demand flexibility startup and an energy storage trade association. Ryan received his M.S. in Management Science and Engineering from Stanford University, and his B.S. in Applied Science from the University of Pennsylvania.

Akhilesh Ramakrishnan

MANAGING ENERGY ASSOCIATE | TORONTO

Akhilesh.Ramakrishnan@brattle.com

Akhilesh specializes in planning and policy issues related to electrification, distributed energy resources, and electric distribution systems. He frequently presents at industry events and publishes on topics relating to the grid edge. He contributed a chapter to the book *Electrification and the Future of Decentralized Electricity Supply*, and his work has been cited by the Department of Energy, *Utility Dive*, and *RTO Insider*. Prior to joining The Brattle Group, Akhilesh developed business strategy and policy for Exelon's electric and gas utility businesses. Akhilesh received his M.S. in Mechanical Engineering from Columbia University, and his B.Tech. in Electrical Engineering from SRM University, India.

Clarity in the face of complexity

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An Assessment of Electrification Impacts on the Pepco DC Distribution System

VOLUME II: TECHNICAL APPENDIX

PREPARED BY

Ryan Hledik
Akhilesh Ramakrishnan
Adam Bigelow
Sanem Sergici
Michael Hagerty
Oliver Grocott
Tina Zhang

PREPARED FOR

Pepco DC

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Brattle

NOTICE

This report was prepared by The Brattle Group for Pepco. It is intended to be read and used as a whole and not in parts. The report reflects the analyses and opinions of the authors and does not necessarily reflect those of The Brattle Group's clients or other consultants.

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I. Introduction

This study assessed the capacity expansion investments needed for Pepco's distribution grid to support full electrification, in line with the District's climate goals and roadmap through 2040. We describe the findings of the study in our Volume I: Summary Report. This Volume II: Technical Appendix provides further detail on the modeling approach and assumptions underlying the analysis.

The focus of the study is load growth-driven distribution system capacity expansion investments. We evaluated the incremental grid upgrade requirements at the feeder and substation level in a full electrification scenario relative to a scenario with no additional electrification. The full electrification scenario assumes a pathway toward achievement of the District's decarbonization goals and strategies, as enacted in the Climate Commitment Amendment Act of 2022[1] and further enumerated in the Carbon Free DC and Clean Energy DC Roadmaps.[2] The District's strategies include both measures that would increase electricity demand (e.g., electrification of buildings and transportation) and measures that would moderate electricity demand (e.g., more stringent building codes and more rooftop solar generation).

We estimated the potential for energy efficiency, demand flexibility, and distributed energy resources—collectively referred to as "grid flexibility technologies"—to defer some of the required grid upgrades. Grid flexibility is defined as the ability to shift demand or supply to meet grid needs. Our estimates consider a range of future flexibility technology adoption rates based on observed participation rates in programs across the US. Important barriers currently prohibiting full-scale deployment and use of grid flexibility will need to be addressed for the higher potential estimates in our study to be achieved.

The following sections summarize our modeling methodology and input assumptions. Section II contains the scenario descriptions and detailed assumptions, Section III provides an overview of the electricity demand modeling methodology, Section IV describes how we modeled grid

[1] D.C. Law 24-176. Climate Commitment Amendment Act of 2022.

[2] Carbon Free DC 2045 Strategy and Clean Energy DC

needs and solutions, and Section V describes how we modeled grid flexibility technologies and deferral potential.

II. Scenario Framework and Assumptions

This section describes the three study scenarios and assumptions regarding electrified equipment penetration, equipment efficiencies, end-use service demand, and fuel consumption in each scenario.

A. Scenario Framework

The framework for this study consists of three scenarios for the Pepco DC system in 2040. The framework is intended to demonstrate the incremental demand impacts of electrification, followed by the mitigating impacts of grid flexibility technologies. The three scenarios are described below.

Scenario 1: No Additional Electrification, No Additional Grid Flexibility
This scenario holds the current (i.e., 2024) fuel mix for transportation and buildings constant through 2040 and assumes no additional distributed energy resources (DERs), energy efficiency, or demand flexibility. The purpose of the scenario is to serve as the status quo baseline relative to which impacts of electrification and grid flexibility can be evaluated. Load growth in this scenario is driven primarily by the forecasted load and customer count growth in Pepco's Ten-Year Forecast (TYF).

Scenario 2: Full Electrification, No Additional Grid Flexibility
This scenario assumes a 2040 fuel mix for transportation and buildings consistent with the electrification strategies enumerated in various District's climate initiatives. Apart from the additional electrification, this scenario preserves the other aspects of Scenario 1, including Pepco's forecasted growth of non-electrification loads. The purpose of this scenario is to allow estimation of grid needs to support the District's electrification goals in the absence of grid flexibility, and to serve as the basis for evaluating the potential value of grid flexibility to the distribution grid.

Scenario 3: Full Electrification, Achievable Grid Flexibility

This scenario builds on Scenario 2 by assuming plausible levels of deployment of grid flexibility technologies—i.e., DERs, energy efficiency, and demand flexibility—by 2040. The purpose of this scenario is to demonstrate the potential value of mitigating grid needs using grid flexibility technologies and to highlight the relative contributions of different technologies. Three different deployment levels—Low, Mid, and High—are modeled in this scenario to reflect the uncertainty in customer adoption rates and in the development of the technical, commercial, and regulatory mechanisms needed to enable the use of these technologies to serve distribution grid needs.

None of the scenarios are intended to be bottom-up forecasts of technology adoption or load growth based on historical trends or technology economics. They are scenarios designed based on policy-driven assumptions about 2040, intended to enable the study of grid upgrade costs and the role of grid flexibility in a full electrification scenario per the Commission's directive.

B. Pepco Customer Count Assumptions

Table 1 shows the system-level customer counts provided by Pepco for 2024 and 2040. Additionally, Pepco provided customer counts for each substation and feeder in 2024. We used the system-level residential and commercial compound annual growth rates (CAGRs) to scale existing customer counts at the substation and feeder levels.

TABLE 1: CUSTOMER COUNTS IN 2024 AND 2040—ALL SCENARIOS

	2024	2040	Annual CAGR
Residential	317,842	469,960	2.47% (+48%)
Commercial	28,029	28,936	0.20% (+3.2%)

C. Building Sector Assumptions

Space and water heating comprise a large share of building energy needs and are the primary end-uses that are targeted for electrification in the District's climate initiatives related to the building sector. We first characterized the existing fuel mix and technologies that serve these end-uses in the District today and then developed assumed penetration levels for electrified technologies in 2040 based on District policies. To develop assumptions on the service demand, (i.e., the useful output energy) needed for these end-uses, we calibrated to the fuel consumed for each end use in 2024 and then assumed efficiencies for each technology to estimate the

useful output energy. This service demand per customer is assumed to remain unchanged through 2040 regardless of which equipment type the customer uses. For example, the average residential customer is assumed to require the same amount of useful heat in 2040 as they did in 2024. We also developed efficiency assumptions for each technology based on today's standards and forecasts, to enable estimate of electricity demand in 2040.

1. Equipment Types and Penetration

In the Full Electrification scenarios, we made the following assumptions on electrified space heating and water heating stock in 2040:

- **Electrified Equipment Penetration:** 90% of stock is heat pumps for both space heating and water heating to align with the Climate DC roadmap initiative for 90% of all homes and buildings to be fossil fuel free by 2040. All customers who used electric resistance heating in 2024 are also converted to using heat pumps by 2040 to align with the recommendations in the Clean Energy DC Plan on phasing out resistance heat.[3] We assumed ground source heat pumps comprise of 1% of the heat pump stock, and the other 99% is air source heat pumps with auxiliary resistive heating.
- **Non-electrified Portion:** The 10% of buildings not converted to electric heat pumps are assumed to be natural gas customers or buildings that use the district heating system. All district heating customers are assumed to remain on district heat and are included in the 10% of stock that is not electrified.

Table 2 summarizes the equipment penetration and count for 2024 and 2040 in each scenario. Throughout this report, we use "penetration" to refer to a percentage of total installed stock.

[3] Clean Energy DC

TABLE 2: 2024 AND 2040 EQUIPMENT PENETRATION (%) AND EQUIPMENT COUNT ('000 BUILDINGS)

		Residential			Commercial		
		2024	2040 No Electrification	2040 Electrification	2024	2040 No Electrification	2040 Electrification
Space Heating	Natural Gas	178 (56%)	255 (56%)	44.9 (10%)	7.7 (26%)	8.8 (26%)	2.9 (8%)
	Fuel Oil	4.9 (2%)	7.0 (2%)	-	1.8 (6%)	2.0 (6%)	-
	Electric Resistance	82.6 (26%)	118 (26%)	-	8.6 (29%)	9.9 (29%)	-
	ASHP	48.0 (15%)	68.8 (15%)	40.0 (87%)	6.5 (22%)	7.5 (22%)	30.9 (89%)
	GSHP	-	-	0.4 (1%)	-	-	0.3 (1%)
	Other	-	-	-	5.0 (17%)	5.8 (17%)	-
	District Heat	-	-	-	0.27 (1%)	0.32 (1%)	0.3 (1%)
	No Heating	6.4 (2%)	9.2 (2%)	9.2 (2%)	0.21 (1%)	0.25 (1%)	0.3 (1%)
Water Heating	Natural Gas	148.3 (46%)	212.7 (46%)	45.8 (10%)	7.3 (26%)	8.9 (26%)	3.0 (9%)
	Fuel Oil	3.0 (1%)	4.3 (1%)	-	0.1 (0%)	0.1 (0%)	-
	Electric Resistance	167.7 (52%)	240.3 (52%)	-	21.7 (73%)	25.2 (73%)	-
	Heat Pump	-	-	412.6 (90%)	-	-	31.2 (90%)
	Other	-	-	-	-	-	-
	District Heat	-	-	-	0.05 (0%)	0.05 (0%)	0.06 (0%)
	No Heating	-	-	-	0.35 (1%)	0.41 (1%)	0.41 (1%)

Sources: Existing space heating and water heating stock penetration and energy usage estimated using EIA's Residential Energy Consumption Survey (RECS) and Commercial Building Energy Consumption Survey (CBECS)

2. Equipment Efficiencies

Table 3 summarizes our assumed coefficients of performance (COP) for each equipment type.

TABLE 3: EQUIPMENT COP ASSUMPTIONS

		Residential		Commercial	
		2024	2040	2024	2040
Space Heating	Natural Gas	0.80	0.95	0.85	0.85
	Fuel Oil	0.83	0.85	0.85	0.87
	Electric Resistance	0.98	1.00	1.00	1.00
	ASHP	Varies based on temperature. See Figure 1.			
	GSHP	3.60	3.60	3.50	3.50
Water Heating	Natural Gas	0.61	0.61	0.82	0.95
	Fuel Oil	0.64	0.66	0.81	0.81
	Electric Resistance	0.92	0.92	0.98	0.98
	Heat Pump	3.33	3.33	3.90	3.90

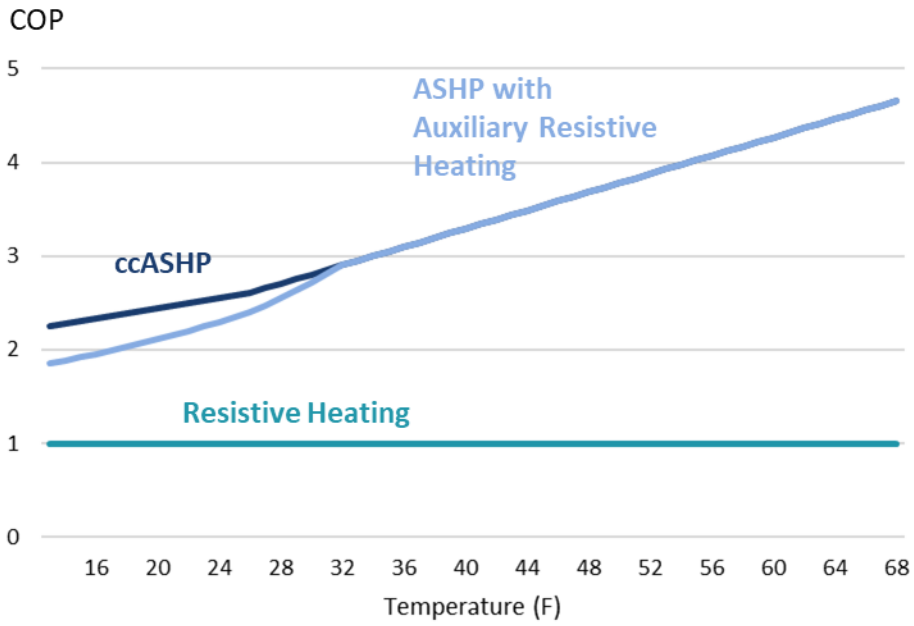
Sources: The 2024 and 2040 assumptions are based on the EIA Residential and Commercial Building Technologies Reference Case[4].

ASHP COPs, as shown in Figure 1, are modeled based on a temperature-COP curve. The COP varies in each hour based on the outdoor temperature in that hour in the modeled weather year. The auxiliary resistive heating is assumed to begin operating at temperatures below 32°F to supplement the heat pump. As the temperature gets colder, the overall COP of the system (ASHP + resistive heat) worsens as the resistive heating supplies a greater portion of the output. In the Full Electrification with Grid Flexibility scenario, we model deployment of cold-climate air source heat pumps (ccASHPs) in lieu of a portion of the ASHPs. The ccASHPs are modeled as

[4] EIA Residential and Commercial Building Technologies Reference Case

being sized to meet the full heating load without resistive backup, and therefore, their COPs are slightly higher at lower temperatures.

FIGURE 1: ASHP COP CURVE



Source: The heat pump COP-temperature curve is from Gibb, et al., Coming in from the cold: Heat Pump efficiency at low temperatures. We estimate the curve for ASHPs with auxiliary resistive heating by blending the resistive heating COP of 1 at temperatures below 32F.

Due to uncertainty around federal standards for appliance efficiency, we do not assume efficiency improvements for the installed stock of heat pumps by 2040.

3. Fuel Consumption and Service Demand

We calibrated to the 2024 fuel consumption by technology type based on per customer estimates in EIA's Residential Energy Consumption Survey (RECS) and Commercial Energy Consumption Survey (CBECS), multiplied by customer counts in the District. We benchmarked the resulting electricity and natural gas consumption estimates against historically reported utility sales to confirm the accuracy of the baselines and make District-specific adjustments where needed.

We used the fuel consumption assumptions, in conjunction with assumed equipment efficiencies, to develop estimates of service demand, i.e., the demand for end-use energy for space and water heating. We assume service demand per customer remains the same as 2024 in 2040, with growth in overall service demand due to a growing customer count. Table 4 and

Table 5 summarize the resulting fuel consumption and service demand assumptions for the residential and commercial sectors.

TABLE 4: RESIDENTIAL FUEL CONSUMPTION AND SERVICE DEMAND

		Fuel Consumption (000 MMBtu)			Service Demand (000 MMBtu)		
		2024	2040 No Electrification	2040 Electrification	2024	2040 No Electrification	2040 Electrification
Space Heating	Natural Gas	6,676	8,060	1,420	5,341	7,657	1,349
	Fuel Oil	55	76	-	45	65	-
	Electric Resistance	445	626	-	436	626	-
	ASHP	244	350	2,416	818	1,173	8,090
	GSHP	-	-	23	-	-	82
	Other	-	-	-	-	-	-
	District Heat	-	-	-	-	-	-
	No Heating	-	-	-	-	-	-
Water Heating	Natural Gas	3,249	4,658	1,004	1,982	2,841	612
	Fuel Oil	38	83	-	38	55	-
	Electric Resistance	1,254	1,798	-	1,154	1,654	-
	Heat Pump	-	-	1,182	-	-	3,937
	Other	-	-	-	-	-	-
	District Heat	-	-	-	-	-	-
	No Heating	-	-	-	-	-	-

TABLE 5: COMMERCIAL FUEL CONSUMPTION AND SERVICE DEMAND

		Fuel Consumption (000 MMBtu)			Service Demand (000 MMBtu)		
		2024	2040 No Electrification	2040 Electrification	2024	2040 No Electrification	2040 Electrification
Space Heating	Natural Gas	7,101	8,211	2,698	6,036	6,979	2,293
	Fuel Oil	483	545	-	410	474	-
	Electric Resistance	1,088	1,258	-	1,088	1,258	-
	ASHP	180	208	2,452	605	700	8,258
	GSHP	-	-	24	-	-	83
	Other	1,244	1,439	-	1,058	1,223	-
	District Heat	199	231	231	169	196	196
	No Heating	-	-	-	-	-	-
Water Heating	Natural Gas	1,069	1,067	358	877	1,014	340
	Fuel Oil	13	15	-	11	12	-
	Electric Resistance	558	645	-	546	632	-
	Heat Pump	-	-	338	-	-	1,318
	Other	-	-	-	-	-	-
	District Heat	33	33	33	27	32	32
	No Heating	-	-	-	-	-	-

D. Transportation Sector Assumptions

Electrification of light-, medium-, and heavy-duty vehicles (LDVs, MDVs, and HDVs) is a key part of the District's climate initiatives. We developed 2040 electrified LDV assumptions based on the EV sales targets set in the Advanced Clean Cars Act.[5] Sale targets increase from around 20% today to 100% by 2035. Our MDV and bus electrification assumptions are based on the Clean Energy DC Omnibus Amendment Act requirement that all public buses and privately operated fleets must be low-or-zero emission vehicles.[6] Finally, we developed the electric HDV penetration based on the target for residual emissions from diesel in the Clean Energy DC roadmap, assuming that most residual diesel consumption is for non-electrified HDVs.

The following tables summarize our assumptions on vehicle counts, efficiencies, average annual mileage per vehicle, and total fuel demand.

[5] DC Adoption of Advanced Clean Car Act.

[6] Clean Energy DC Omnibus Amendment Act

TABLE 6: 2024 AND 2040 PENETRATION (%) AND EQUIPMENT COUNT ('000 VEHICLES)

		Vehicle Count		
		2024	2040 No Electrification	2040 Electrification
Light-Duty Vehicle Usage	ICE	298,290 (92%)	306,451 (92%)	91,639 (27%)
	EV	8,100 (2%)	8,322 (2%)	245,530 (73%)
	HEV	18,100 (6%)	18,595 (6%)	-
	PHEV	3,700 (1%)	3,801 (1%)	-
Medium-Duty Vehicle Usage	ICE	3,357 (100%)	3,449 (100%)	690 (20%)
	EV	-	-	2,759 (80%)
Heavy-Duty Vehicle Usage	ICE	480 (100%)	493 (100%)	443 (90%)
	EV	-	-	49 (10%)
Bus Usage	ICE	7,573 (92%)	7,780 (92%)	848 (10%)
	EV	38 (0.5%)	39 (0.5%)	7,636 (90%)
	HEV	648 (7.5%)	666 (7.5%)	-

Source: 2024 vehicle counts estimated using Alternative Fuels Data Center[7] and VIUS Census Data.[8] Abbreviations: Internal combustion engine (ICE), battery electric vehicles (EVs), hybrid EVs (HEVs), plug-in hybrid EVs (PHEVs).

[7] Alternative Fuels Data Center: Vehicle Registration Counts by State

[8] VIUS211A: All Vehicles by ... - Census Bureau Table

TABLE 7: 2024 AND 2040 ANNUAL MILEAGE AND VEHICLE EFFICIENCIES

		Annual Mileage (millions of miles)			Efficiencies	
		2024	2040 No Electrification	2040 Electrification	2024	2040
Light-Duty Vehicle Usage	ICE	2,985	3,200	957	38 mpg	45 mpg
	EV	81	87	2,564	3.28 mi/KWh	4.1 mi/kWh
	HEV	181	194	-	1.78 mi/kWh	1.8 mi/kWh
	PHEV	37	40	-	3.86 mi/kWh	4.8 mi/kWh
Medium-Duty Vehicle Usage	ICE	35	38	8	9 mpg	11 mpg
	EV	-	-	31	0.72 mi/kWh	0.97 mi/kWh
Heavy-Duty Vehicle Usage	ICE	25	28	25	6.5 mpg	7.8 mpg
	EV	-	-	3	0.42 mi/kWh	0.45 mi/kWh
Bus Usage	ICE	125	135	15	5.3 mpg	5.3 mpg
	EV	1	1	133	0.47 mi/kWh	0.47 mi/kWh
	HEV	11	12	-	0.19 mi/kWh	0.19 mi/kWh

Source: Vehicle efficiencies and average VMTs from EV Database,[9] EIA,[10] and Federal Highway Administration.[11]

[9] Energy consumption of full electric vehicles cheatsheet - EV Database; PHEV electric efficiency is assumed to be EV multiplied by ratio of average PHEV to EV efficiency.

[10] U.S. Energy Information Administration - EIA - Independent Statistics and Analysis

[11] Table MV-1 - Highway Statistics 2023 - Policy | Federal Highway Administration

TABLE 8: 2024 AND 2040 FUEL CONSUMPTION

		Fuel Consumption (GWh or million gallons)		
		2024	2040 No Electrification	2040 Electrification
Light-Duty Vehicle Usage	ICE (000,000 gallons)	78.5	71.6	21.4
	EV (GWh)	25	21	627
	HEV (GWh)	102	110	-
	PHEV (GWh)	10	8	-
Medium-Duty Vehicle Usage	ICE (000,000 gallons)	3.9	3.6	0.73
	EV (GWh)	-	-	32
Heavy-Duty Vehicle Usage	ICE (000,000 gallons)	3.9	3.6	3.3
	EV (GWh)	-	-	6
Bus Usage	ICE (gallons)	23.6	25.5	2.8
	EV (GWh)	1	1	281
	HEV (GWh)	57	62	-

Source: Based on stock, efficiencies, and annual mileage from above tables

III. Electricity Demand Modeling

This section describes our approach to modeling hourly load in 2040 at the feeder and substation level. The approach consisted of three steps:

- Gather and clean 2024 historical hourly load for each feeder and substation provided by Pepco

- Disaggregate 2024 load into electrification and non-electrification loads and grow baseline loads based on Pepco's feeder-specific load forecast through 2040
- Add on electrification loads in 2040 based on the assumed technology penetration levels in the scenario and hourly load shapes for each electrified technology

The sub-sections below describe each of these steps in further detail.

A. Baseline Year

We selected 2024 as the baseline year for the study, used as the source for the baseline hourly load shape and as the baseline weather year, which influences heating needs and COPs.

Peak load varies from year to year, partly due to the maximum summer and minimum winter temperatures. More extreme temperatures generally result in higher peak loads. Pepco's normal planning process uses a 90/10 year, which corresponds to a minimum temperature of 10°F and a maximum temperature of 101°F.[12] 2024 corresponded reasonably closely to various 90/10 year metrics. The winter minimum temperature in 2024 was 16°F, and the summer maximum temperature was 103°F.[13]

In addition, using 2024 ensures that we use the most recent available full year of data, which captures impacts of customer growth, changes in behavior, deployment of energy efficiency and DERs, and various other dynamics.

B. Feeder and Substation Data

Using Pepco's Ten-Year Forecast and other supplemental data, we collect the following information on each feeder and substation to inform our 2040 load growth estimates:

- **Pepco 2025–2034 Ten-Year Plan:** For each feeder and substation, the 2024 peak load, the 2034 planned peak load, rated capacity, and any load transfers that are planned out to 2034.
- **2024 Hourly Load**: Actual 2024 substation and feeder level hourly load.

[12] Over the last 30 years, the maximum annual temperature was 101°F in the 90th percentile year (August 3, 2006), and the minimum annual temperature was 10°F in the 90th percentile year (February 6, 1996).

[13] Temperature data reported from Reagan National Airport (DCA) weather station.

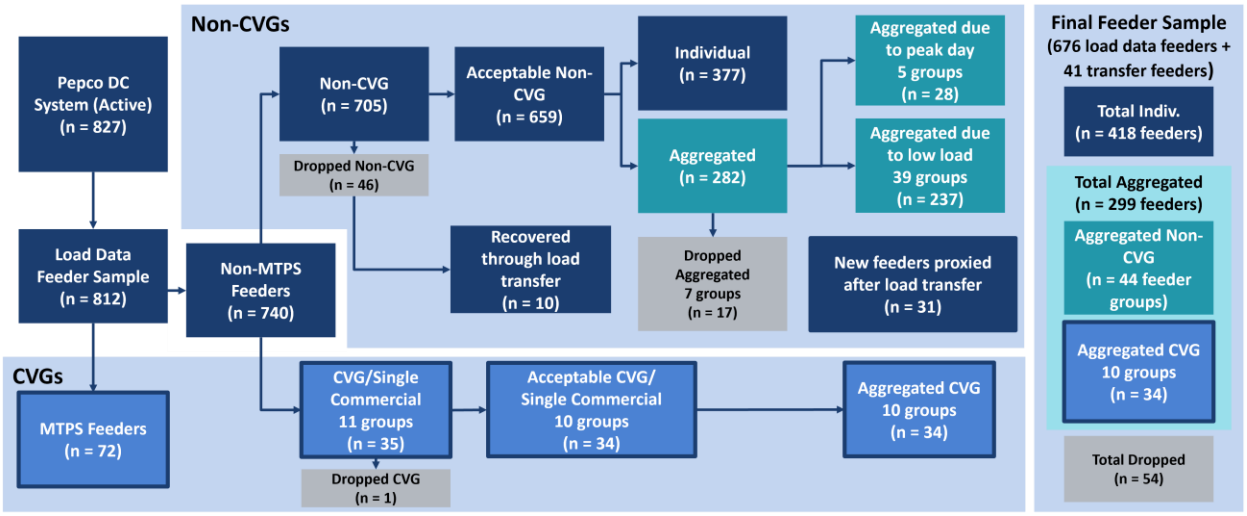
- **2024 Customer Counts**: 2024 residential and commercial customer counts for each feeder and substation.

1. Cleaning Feeder and Substation Load Data

a. Feeder Data

Figure 2 describes our treatment of the hourly feeder load data for Pepco DC's system. Because most of the data was complete, our approach was to eliminate the few feeders with insufficient data from the study. In addition, due to the complexity of load transfers occurring between neighboring feeders within the baseline-year period, we developed a set of data completeness criteria to identify feeders that were more accurately characterized by the aggregated hourly load of the whole feeder group. We modeled the 299 feeders identified through this process as 44 feeder groups, rather than as individual feeders in order reflect the ability to frequently shift load between the feeders. We modeled the other 418 feeders as individual feeders, and we dropped a total of 54 feeders due to insufficient data.

FIGURE 2: FEEDER DATA CLEANING PROCESS



The data cleaning process consisted of the following steps:

1. We received 2024 hourly load for 812 of 827 feeders in operation in 2024. The 15 feeders we did not receive data for were feeders that do not have SCADA systems and, therefore, do not have hourly load data readily available.
2. We preserved the 72 feeders that serve DC Metro stations, labeled Metro Traction Power System (MTPS) feeders, as-is through 2040, with only Pepco-forecasted load growth in all scenarios.

3. We subset the remaining 740 non-MTPS feeders into our primary feeder sample (705) and Common Voltage Group (CVG) feeders (35), typically pairs of feeders serving single commercial customers. We aggregated hourly loads for individual CVG feeders up to the feeder group level to form 11 CVG feeder groups, with 10 CVG groups meeting our data sufficiency criteria, described in the next step, to be modeled in our sample.
4. We processed the hourly load data for 705 feeders individually for completeness. Individual hourly feeder data that met one of the criteria below was dropped from the sample if there were no customers assigned to the feeder and aggregated to the feeder group level if there were customers assigned to the feeder. We used the following thresholds to check for data sufficiency:
   - Average hourly load less than 0.05 MW in 2024
   - One or more sets of consecutive null values of more than three weeks (504 hours)
   - Any null values during winter and summer system peak days in 2024

   28 feeders were dropped due to these filters.
5. We aggregated feeder groups containing a flagged feeder with active customer counts and retested the feeder group hourly load for completeness. We dropped 7 groups from the sample. The remaining 44 aggregated groups (containing 299 individual feeders) and 377 individual feeders made up the active 2024 feeders used in our modeling sample.
6. An additional 41 feeders are added to the sample by way of load transfers and already-planned new asset builds through 2034, in accordance with Pepco's plan.

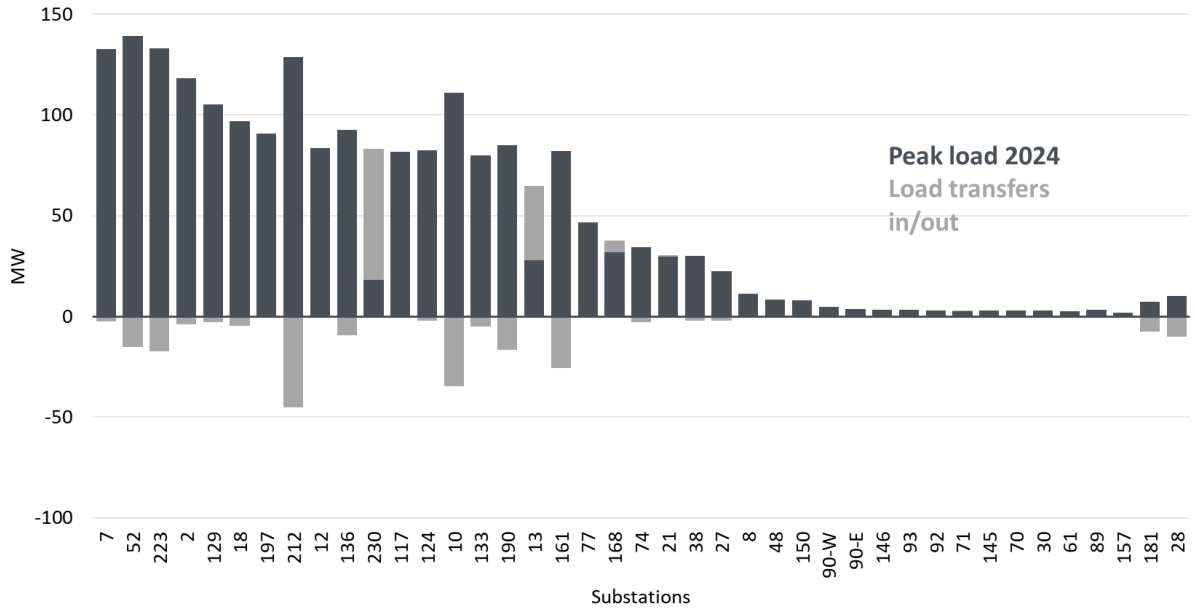
b. Substation Data

We received hourly 2024 load data for 41 of 45 substations. The four substations not included in the study were 4kV primary network substations with a combined contribution to system peak of less than 1%. Our 2040 sample contained 38 substations and incorporated the planned decommissioning of three substations per Pepco's TYF.

c. Load Transfers

Before forecasting load data into the future, we first initiate all feeder and substation load transfers identified in Pepco's TFY so that usage shapes are preserved. For example, a feeder or substation that gets 50% of its load transferred out has its load shape preserved, and the feeder/substation that receives the transfer has the exact load shape transferred onto it. Figure 3 shows substation peaks after load transfers. We apply a similar step for feeder loads.

FIGURE 3: PLANNED SUBSTATION LOAD TRANSFERS RELATIVE TO 2024 PEAK LOAD



2. Forecast of Non-Electrification Load Growth

To avoid double-counting electrification loads, we first disaggregate the 2024 load into electric space and water heating and transportation loads (collectively referred to as electrification loads) and other loads (non-electrification loads). Because feeder-specific heating/transportation equipment saturations were not available, for the purposes of disaggregation, we assume that the residential and commercial technology penetration on each feeder is equal to the Pepco system average penetration (provided in Section II). This allowed us to disaggregate the 2024 load into four primary components: residential baseline load, residential electrified load, commercial baseline load, and commercial electrified load.

By disaggregating and isolating the baseline load in 2024 from any electrification load, we were able to scale baseline residential and commercial load components at their respective, distinct growth rates from Pepco's feeder-specific load forecast. We modeled 2034 load for each distribution asset such that each load shape reflected the peak load growth forecasted in Pepco's TYF. Because Pepco's TYF ends in 2034, we used customer count growth through 2040 to extrapolate the non-electrification load growth on each asset through 2040.

3. Modeling Electrification Loads

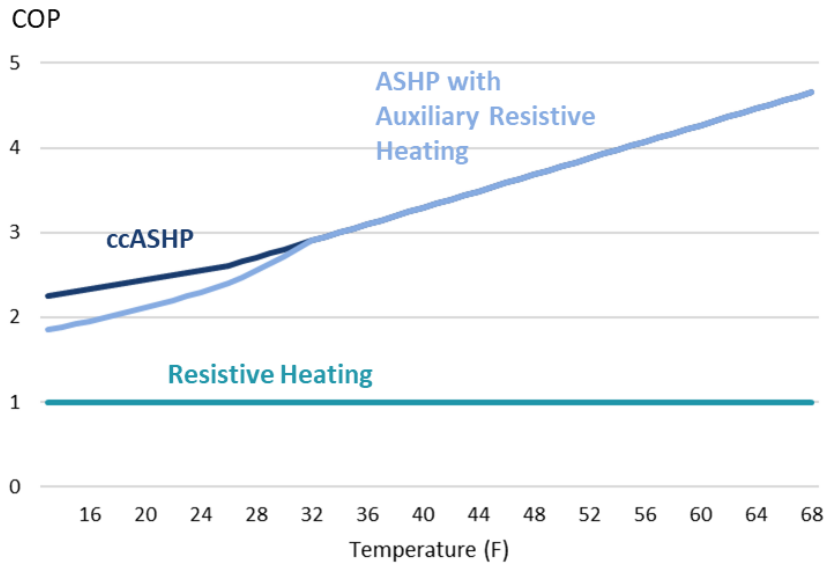
Electrification load on each feeder is modeled based on the count of electrified space and water heating equipment and vehicles on each feeder, combined with an assumed hourly load shape for each electrified end use.

The count of electrified equipment on each feeder is developed based on the residential and commercial customer counts and the system-wide average equipment penetration for each type of equipment. We do not attempt to develop a feeder-specific allocation of equipment because at high penetration levels approaching 100%, all locations begin to converge to similar penetration levels. Therefore, we assume for example, that if 90% of residential customers in the District have heat pumps, 90% of residential customers on every feeder have heat pumps. LDVs are allocated based on residential customer count, and MHDVs are allocated based on commercial customer count. There is a significant amount of feeder-level load shape variation in this study due to the use of actual 2024 data as the baseline, and allocation of electrified loads based on the feeder-specific proportion of residential and commercial customers.

We model hourly electrification load based on assumed hourly load shapes for each type of equipment. These load shapes and their sources are provided in Figures 4–6 below.

Space Heating: The space heating load shape varies across the 8,760 hours of the year based on hourly temperature in the 2024 weather year. We develop hourly heating demand based on an allocation of annual heating service demand to each hour of the year proportional to the share of annual heating degree days (HDDs) on each day. Electric resistance and GSHP load scales linearly with HDDs. ASHPs are modeled on a more granular level as they get less efficient the colder it gets. Further, we assume that some share of ASHP heating load is served by electric resistance backup during any hour in which the temperature drops below freezing. The ASHP COP efficiency curve is shown in Figure 4. We look up the ASHP COP in each hour of the 2024 weather year to dynamically model the associated heating load.

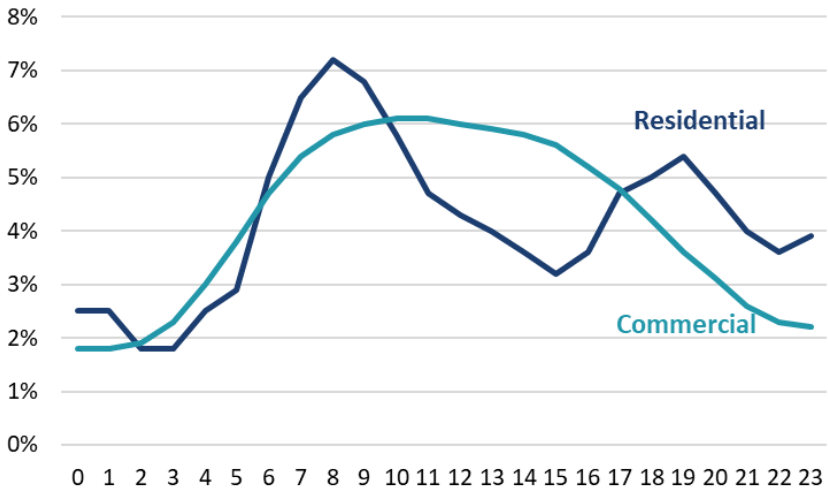
FIGURE 4: ASHP COP CURVE



Source: The heat pump COP-temperature curve is from Gibb, et al., Coming in from the cold: Heat Pump efficiency at low temperatures. We estimate the curve for ASHPs with auxiliary resistive heating by blending the resistive heating COP of 1 at temperatures below 32°F.

Water Heating: Water heating load is modeled using the daily shape in Figure 5.

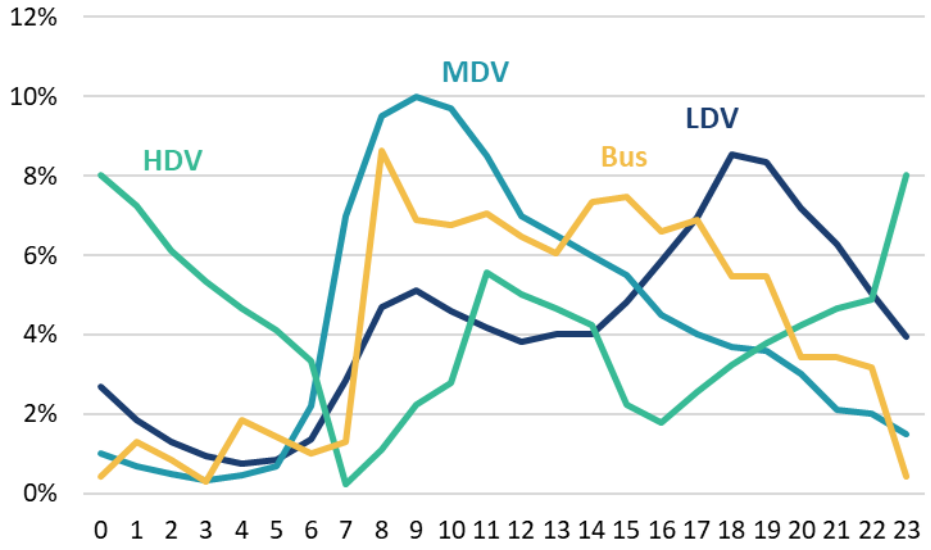
FIGURE 5: WATER HEATING LOAD SHAPE (SHARE OF DAILY LOAD %)



Source: EPRI Load Shape Library

EV Charging: LDV, MDV, HDV, and bus charging loads are modeled using the hourly shapes in Figure 6.

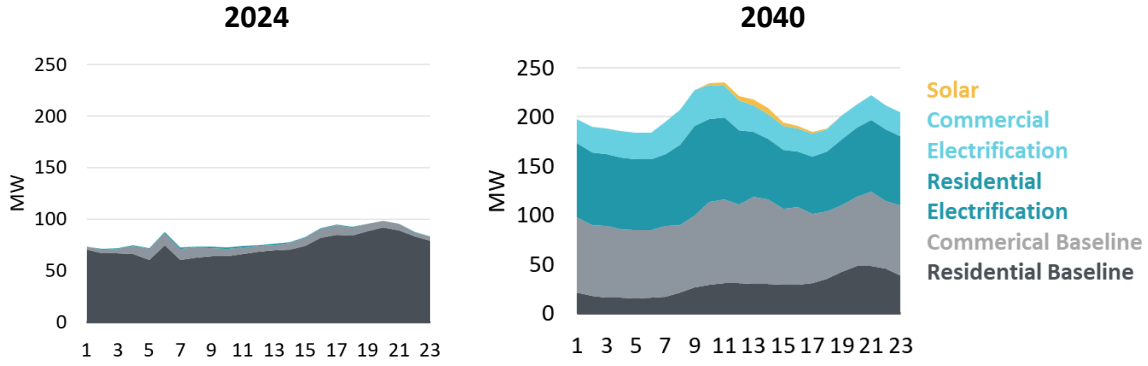
FIGURE 6: DAILY EV CHARGING SHAPE (SHARE OF DAILY LOAD %)



Source: LDV shape from EVI Pro-Lite. MDV from commercial LDV load shape in the California Load Shapes Report. HDV and bus from tractor trailer and school bus load shape respectively in 2021 California Report

The outcome of the asset-specific load modeling process in the Full Electrification scenario is illustrated in Figure 7 for one example substation's peak day.

FIGURE 7: 2024 AND 2040 PEAK DAY LOAD IN THE FULL ELECTRIFICATION, NO ADDITIONAL GRID FLEXIBILITY SCENARIO FOR SUBSTATION 7)



Notes: In 2024, Substation 7 is a summer peaking asset with the highest observed load on July 15, 2024 at 7PM. In 2040, Substation 7 is a winter peaking asset with the highest observed load on January 17, 2040 at 9AM.

IV. Grid Needs and Solutions Modeling

This section describes our methodology for modeling the grid upgrades that would be needed in overloaded locations, and the cost assumptions we received from Pepco for each type of capacity expansion project.

A. Capacity Expansion Solutions and Cost Assumptions

Pepco provided cost estimates based on recent representative projects for each type of capacity expansion solution. The set of solutions includes new feeder builds, feeder conversions, load transfers, building a new transformer bank at a substation, and building a new substation. Because not every type of capacity expansion project is possible at every asset, we developed rules of thumb to disallow certain solutions in some locations. For example, we do not allow addition of transformer banks to substations located in Wards 2 or 6 because these locations were flagged by Pepco as being unlikely to have the physical space for a new transformer. Table 9 summarizes the set of upgrades we used to model solutions to overloads at the feeder and substation level in each scenario.

TABLE 9: CAPACITY EXPANSION SOLUTION COSTS

Component	Upgrade Type	Description	Cost (2025$)
Feeder	New 13kV Feeder	Construct new 13.8kV overhead feeder with summer normal rating of 8.5MVA[14]	$11 million / mile
	4kV Overhead Feeder Conversion	Convert 4kV feeder to 13kV feeder. Transfer load out from 4kV substation	$6.2 million
	Feeder Load Transfer	Transfer feeder overload MVA to a new 13kV feeder	Included in cost of new feeder construction
Substation	New Transformer Bank *(Available for select <100 MVA Substations)*	Install new transformer at substation with available bank space. Increase firm capacity to 144 MVA	$8 million
	New Transformer Bank *(Available for <165 MVA Substations)*	Install new transformer at substation with available bank space. Increase firm capacity to 210 MVA	$8 million
	New 210 MVA Substation	Construct new 210 MVA substation	$294 million
	Substation Load Transfer	Transfer substation overload MVA to new 210 MVA substation	Included in cost of new substation construction

B. Distribution Buildout Model Upgrade Criteria

In alignment with Pepco's capacity planning criteria, we flag an asset as requiring a capacity expansion solution if its peak hourly load is greater than 100% of normal rated seasonal capacity[15] in any hour of the year in 2040.

[14] Per Pepco's rule of thumb, we assign new 13kV feeders an average length of one mile to treat the construction of a new feeder as unit cost of $11 million.

[15] Asset MVA ratings are higher in the winter due to colder conditions.

Feeders. For any 13kV feeder or aggregated feeder group with an identified winter or summer overload, new 13kV feeders with a normal rating of 8.5 MVA are constructed to meet overload capacity. If the overload on the feeder or group is greater than 8.5 MVA, the lowest possible number of new 8.5 MVA feeders are constructed to meet overload capacity, and the overload is distributed across newly constructed feeders. For any 4kV feeder or feeder group experiencing a winter or summer overload, a 4kV feeder is converted to a 13kV feeder and all load is transferred to the new 13kV feeder.

Substations. Prior to implementing the distribution buildout model, we identified the possible upgrade capabilities for all substations on the Pepco DC system. For substations with a capacity under 100 MVA, Pepco provided a comprehensive breakdown of maximum feasible capacity increases through additional transformer banks. For substations with capacity of 140–165 MVA, we assume an additional transformer bank can be added to increase firm capacity to 210 MVA. Existing substations located in Pepco DC Wards 2 and 6 are exceptions to this rule, as they do not have space for an additional transformer bank. This means overloads to substations in these two Wards must be resolved through construction of a new substation. An exception is made for Mt. Vernon Sub 230, a new substation energized in 2024 in Ward 6, because it was planned with room for an additional transformer bank.

For all substation overloads, our model selects the lowest-cost option that satisfies component- and Ward-specific feasibility requirements. For 5 of 10 overloaded substations on the Pepco DC system, the lowest cost option is to install an additional transformer bank to increase firm capacity to 210 MVA. For substations with an existing firm capacity of 210–216 MVA, new substations must be constructed to mitigate observed overloads. Overloaded substations serving 4kV overhead feeders are afforded the mitigation option of feeder conversion and load transfer out to a substation within the same Ward. This is the lowest-cost mitigation option when an existing or new substation is observed to have the available headroom. In these cases, a 4kV feeder served by the overloaded substation is converted to a 13kV feeder, connected to an existing or new substation in the same ward, and all feeder load is transferred to the converted 13kV feeder.

V. Grid Flexibility Modeling

A. Overview

We considered a range of grid flexibility solutions that potentially could help reduce peak load and as a result defer peak demand-driven upgrades to the distribution system. The grid flexibility solutions considered in our study include DERs, energy efficiency, and demand flexibility measures.

As described in the Volume I report, there is significant potential for grid flexibility to defer upgrades to the distribution system. However, various conditions must be met for this outcome to be achieved. For example, the cost of enabling grid flexibility needs to be less than the cost of the distribution upgrade, grid flexibility measures need to be adopted at significant levels in a specific location of the grid to provide a sufficient magnitude of demand reduction, and the utility needs infrastructure that provides the necessary visibility and control to manage the grid flexibility resources. Regulatory, technical, and market barriers likely will need to be overcome for those conditions to be achieved.

Given the uncertainty in how grid flexibility opportunities may evolve on the Pepco DC system over our study horizon, we created an illustrative portfolio of grid flexibility resources and analyzed the portfolio's ability to defer distribution upgrades at various levels of adoption. The analysis is not intended to represent a comprehensive assessment of all possible grid flexibility measures. In other words, it is not a potential study. Rather, our study illustrates the technical ability of grid flexibility to impact distribution upgrade needs at various significant levels of deployment.

B. Grid Flexibility Measures

Below, we describe how we modeled each grid flexibility option included in the portfolio.

BTM solar. The District has a requirement that 15% of annual energy demand be served from distributed solar by 2041.[16] Our analysis considered a scenario in which that level of deployment is met as well as two scenarios in which the target is not met. We assume each

[16] Local Solar Expansion Amendment Act of 2022

substation or feeder's load is served by that same share of solar generation. Our assumed hourly solar generation profile is based on NREL's System Advisor Model (SAM) for a location in Pepco's service territory.[17] The hourly load profile is subtracted from each feeder or substation's load to establish the contribution of BTM solar to reducing local peak demand. We note that basing this analysis on the representative solar output profile for single year is a simplification and may overstate the contribution of standalone solar to distribution upgrade deferral, as solar output is variable across years and may not be attributed to distribution capacity value in certain planning contexts.

Weatherization. This measure refers to building envelope upgrades that reduce the building's heating demand, such as air sealing, attic insulation, duct sealing, and window upgrades. The reduction in heating demand is measured as a proportional decrease in demand for heating in all hours. We assume a 10% reduction in heating demand per building.[18] We use illustrative adoption assumptions of 20%, 10%, and 5% of all buildings in the District for the three grid flexibility scenarios. Weatherization is generally a valuable but more difficult energy efficiency option for customers to adopt, due to up-front costs and the inconvenience of installing the measures, among other factors.

Cold climate heat pumps. Whereas standard air source heat pumps often include auxiliary resistive heating for temperatures below 32°F, cold climate air-source heat pumps do not require resistive heating and therefore, are more efficient on the coldest days of the year that drive winter peak demand. As shown in Figure 4 above, we assumed cold climate ASHPs would have a coefficient of performance of 2.34 at 16°F (the coldest modeled hour), representing roughly a 20% improvement in efficiency relative to ASHPs with auxiliary resistive heating. We assumed illustrative cold climate heat pump adoption levels of 50%, 25%, and 12.5% of all heat pumps in the District across the three grid flexibility scenarios.

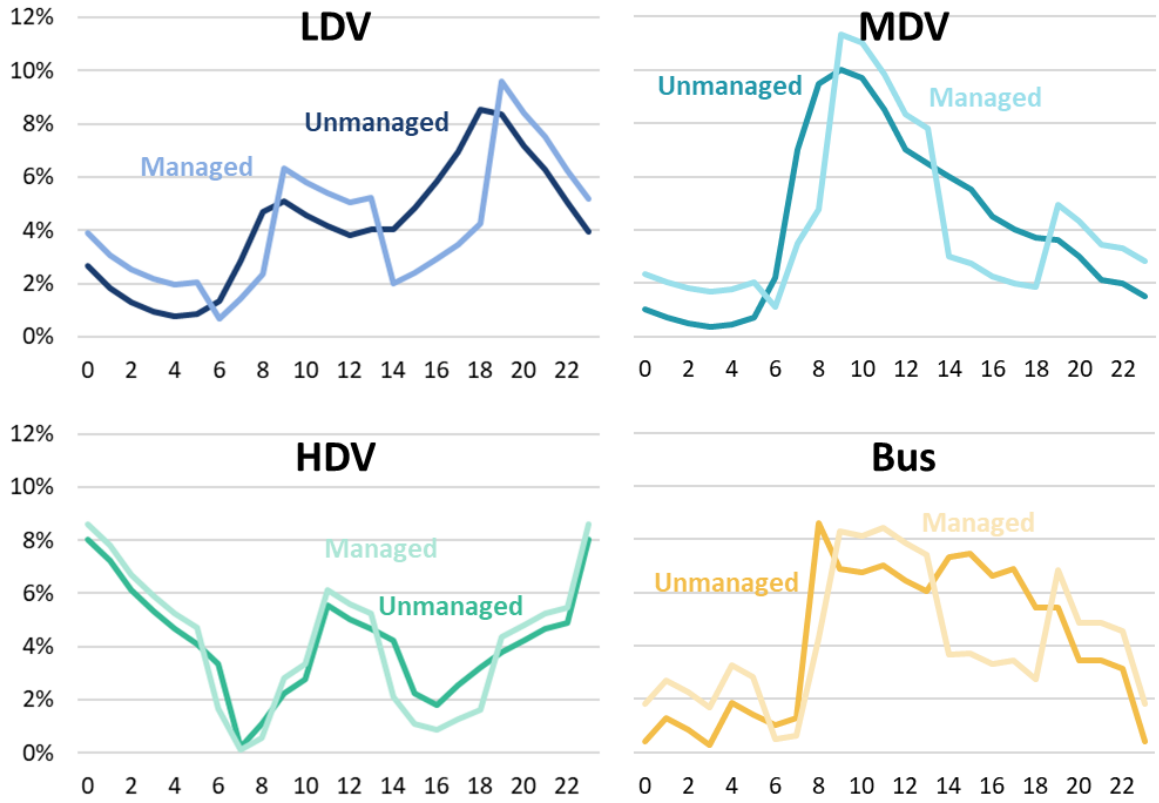
EV managed charging. This measure assumes that EV charging load will be shifted away from system peak load hours and into overnight hours with lower demand. That load shifting could be driven by response to a time-of-use rate or active control by the utility or an aggregator; our analysis is agnostic to the incentive mechanism or means of control. We make the simplifying assumption that the EV managed charging load profiles are static and designed to shift load away from the hours of the system peak. We assume 50% of charging load during the peak hours of 6am–9am and 2pm–7pm would be reduced and shifted to all other hours, based on a

[17] NREL SAM

[18] Based on the energy savings ranges for the Weatherization Assistance Program reported in Oak Ridge National Lab's National Evaluations Summary Reports.

review of utility managed charging pilots across the US. Figure 8 below illustrates the assumed charging load profiles before and after load shifting.

FIGURE 8: EV MANAGED CHARGING SHAPES (% OF DAILY LOAD)



Heating load control. While heat pump load control is still in the early stages of deployment, with technical barriers to be addressed, it has the potential to be an important grid flexibility option given that it targets the end use that is primarily driving winter peak demand. We assume participants in the heating load control program reduce between 20% and 40% of their heating load during a three-hour demand response event, with up to 15 events being called per year, based typical program event limits observed across various U.S. utility smart thermostat programs.[19] The curtailed load is entirely offset by two hours of pre-heating before the event and three hours of "snapback" after the event. The events are called to target each feeder or substation's peak demand individually, after accounting for changes in load due to the other demand flexibility measures described above. We assume 25%, 12.5%, and 5% participation scenarios among customers with heat pumps. While heating load control is largely still in the

[19] The State of Demand Flexibility Programs and Rates and Their Role in Managing Peak Demand

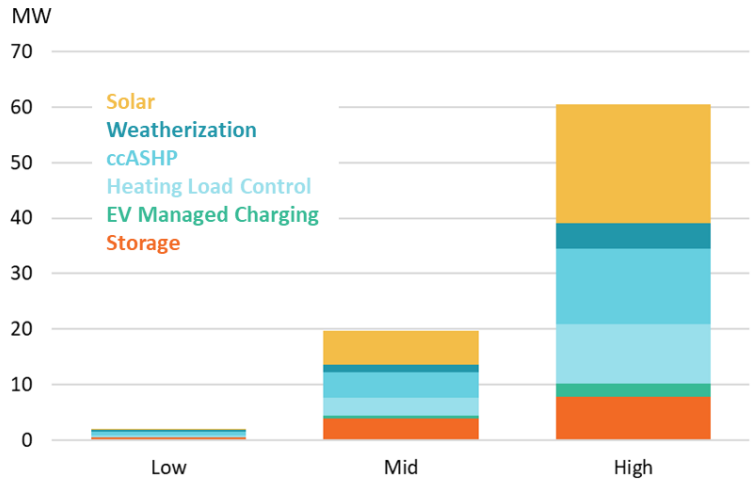
pilot phase, some utilities have achieved air-conditioning load control participation rates at the levels modeled in our scenarios.

Batteries. After accounting for the impacts of the grid flexibility measures described above, we identified any distribution assets that had remaining overloads that could be reasonably resolved with through deployment of distributed batteries. We assumed that a feeder or substation would need to satisfy the following illustrative conditions in order to be a candidate for deferral with distributed storage: (1) overloads of up to 2.5% in the low case, 5% in the mid case, and 10% in the high case, to ensure a feasible level of storage deployment relative to total load at the location; (2) less than four hours of overloading on any given day, to align with the likely duration of deployed batteries; and (3) fewer than 35 overloaded hours in the low/mid cases and 70 hours in the high case, to allow for value stacking in the wholesale market and otherwise limit dispatch events for batteries located behind the customer's meter. Under those conditions, we dispatched storage to mitigate the overloads.

C. Impacts

Based on the assumptions described above, each grid flexibility option makes a different contribution to relieve grid overloads. Figure 9 below summarizes the total megawatts of overload attributed to each grid flexibility option.[20]

FIGURE 9: GRID FLEXIBILITY DEMAND REDUCTIONS THAT ELIMINATE OVERLOADS



[20] We assigned savings value to each grid flexibility option based on the dispatched MWhs on days in which the option was utilized on an overloaded distribution asset. If there were additional savings beyond the rated capacity during that hour, the savings that contributed to the overload were allocated to each grid flexibility technology proportional to the total dispatch during the overloaded hours.

CERTIFICATE OF SERVICE

I hereby certify that a copy of Potomac Electric Power Company's 15-Year Climate Solutions Plan (CSP) and Electrification Impact Study – Summary Report in Formal Case Nos. 1167 has been served this October 31, 2025 to:

Ms. Brinda Westbrook-Sedgwick
Commission Secretary
Public Service Commission
of the District of Columbia
1325 G Street, N.W.
Suite 800
Washington, DC 20005
bwestbrook@psc.dc.gov

Sandra Mattavous-Frye, Esq.
Sarah Kogel-Smucker, Esq.
People's Counsel
Office of the People's Counsel
655 15th Street NW, Suite 200
Washington, DC 20005
smfrye@opc-dc.gov
ssmucker@opc-dc.gov

Erin Murphy
Environmental Defense Fund
1875 Connecticut Ave., N.W.
Suite 600
Washington, DC 20009
emurphy@edf.org

Angela Parsons
Public Service Commission
of the District of Columbia
1325 G Street, N.W.
Suite 800
Washington, DC 20005
aparsons@psc.dc.gov

Larry Martin
DC Consumer Utility Board
1631 Newton Street, NW
Washington, DC 20010
lmartindc@gmail.com
eugene.imhoff@gmail.com
larisa.dobriansky@gmail.com

Frann G. Francis, Esq.
Senior Vice President and General Counsel
AOBA
1025 Connecticut Avenue, NW
Suite 1005
Washington, DC 20036
ffrancis@aoba-metro.org

Brian Caldwell, Esq.
Assistant Attorney General
DC Government
441 4th Street, NW
Suite 600-S
Washington, DC 20001
Brian.caldwell@dc.gov

Moxila Upadhyaya
Venable LLP on behalf of AltaGas Ltd.
600 Massachusetts Ave, NW
Washington, DC 20001
MAUpadhyaya@Venable.com

Nina Dodge
DC Climate Action
6004 34th Place, NW
Washington, DC 20015
Ndodge432@gmail.com

Cathy Thurston-Seignious, Esq.
Supervisor, Administrative & Associate General Counsel
Washington Gas
1000 Maine Avenue, SW, Suite 700
Washington, DC 20024
Cthurston-seignious@washgas.com

Susan Miller
Earthjustice
1625 Massachusetts Ave., NW
Suite 702
Washington, DC 20036
smiller@earthjustice.org

/s/ *Dennis Jamouneau*
Dennis Jamouneau