November 16, 2022

The Honorable Phil Mendelson
Chairman
Council of the District of Columbia
1350 Pennsylvania Avenue NW, Suite 504
Washington, DC 20004

RE: Annual Report of the Sustainable Energy Utility Advisory Board

Dear Chairman Mendelson:

Pursuant to Section 204(g) of the Clean and Affordable Energy Act of 2008 (CAEA), D.C. Law 17-250, I hereby transmit the Sustainable Energy Utility Advisory Board's (Board) Annual Report (Report) on behalf of the Board. This Report provides the Board's assessment of the DC Sustainable Energy Utility's (DCSEU) performance in Fiscal Year 2021 and offers recommendations to the Department of Energy & Environment (DOEE) and the Council of the District of Columbia (Council). This Report was approved by the Board. It is the Board's understanding that DOEE will make this Report available to the public on its website within 10 days of its submission to the Council, as required by the CAEA.

For the past five years, the DCSEU Board report has been substantially similar in structure, approach, and level of detail. This year, to streamline workflows and make the report more accessible, we have restructured the annual report to make it more actionable and digestible.

Please feel free to contact me at the telephone number or e-mail address below, or Dave Epley at Dave.Epley@dc.gov or (202) 313-1654, if you have any questions regarding this report.

Sincerely,

Bicky Corman
Chair, SEU Advisory Board
(202) 213-1672
bcorman@bickycormanlaw.com

Enclosure

cc: Nyasha Smith, Secretary of the Council
Councilmember Mary Cheh, Chairperson, Committee on Transportation and the Environment.

DC Sustainable Energy Utility Advisory Board
Fiscal Year 2021 Report

DCSEU FY21 Performance & Activities FY21 – FY22

Contents

1. Executive Summary & Introduction

Fiscal Year 2021 was a watershed year for the District of Columbia Sustainable Energy Utility (DCSEU) and its Advisory Board (hereafter "the Board").

In 2021, the Department of Energy and Environment (DOEE) determined it would renew its FY17-FY21 contract with DCSEU for another five years, pending resolution of the contract terms. For the Board, Fiscal Year 2021 (FY21) marked the year in which, DOEE and the DCSEU included a new greenhouse gas (GHG) reduction requirement in the DCSEU's contract as a performance benchmark.

The Board recognized DCSEU's focus, which combined energy savings and social equity targets, is consistent with the Clean and Affordable Energy Act of 2008[1] (CAEA) was not necessarily in lockstep with newer versions of the same law (namely, the Clean Energy DC Omnibus Amendment Act of 2018[2] (CEDC Act)) that now maintained the clarion call for social equity but also for called for dramatically reducing the District's GHG emissions. The Board aims to unleash the DCSEU's potential to transform the clean energy marketplace in ways that will advance the District's objectives.

The Board, DOEE, and the DCSEU have resolved complex and controversial questions, such as whether a GHG performance benchmark should replace the DCSEU's historical energy savings benchmark, or serve as an additional benchmark (the Board recommended, and the current contract specifies, inclusion of both GHG emissions reductions and energy savings benchmarks); whether to maintain distinct energy benchmarks for electric and gas savings (the Board recommended, and the current contract now includes, a single fuel-neutral performance benchmark); and the most sensitive, whether to limit the DCSEU's investments in gas programs (the Board recommended, and the current contract specifies, disallowing investments, absent case-by-case approval, in new natural gas appliances, but permitting spending on retrofits to improve old gas systems' performance).

The Board appreciates the hard work of the individual Board members in shepherding this transformative measure; the exceptional leadership demonstrated by DOEE staff in amassing necessary data; and the enthusiasm and creativity of DCSEU staff in embracing this new focus. The Board also greatly appreciates the significant contributions from the American Council for an Energy-Efficient Economy (ACEEE), Institute for Market Transformation (IMT), the Sierra Club, and members of the public who generously shared their expertise and perspectives with the Board in its deliberations.

The Board was also sensitive to the fact that the DCSEU would be facing increased challenges as it seeks to meet these new objectives. These include challenges posed by the CEDC Act, which offered Pepco and Washington Gas the opportunity to deliver energy efficiency and demand reduction services to District residents and businesses, services traditionally performed primarily by the DCSEU, subject to the Public Service Commission (PSC) approval. The Board continues to believe that the additional resources brought to bear, as well as competition, will benefit District residents and businesses. However, the Board

[1] "CAEA," D.C. Law 17-250, effective Oct 22, 2008, D.C. Official Code §8-1773.01 et seq.
[2] "CEDC Act," D.C. Law 22-257, effective Mar. 22, 2019.

also continues to be mindful that it has a role in helping ensure that the DCSEU can remain competitive, given its significantly smaller budget and, lack of access to information on users' energy patterns. The Board took steps in 2021 to ensure a level playing field with Pepco, such as recommending modification of a performance benchmark in the DCSEU's contract (e.g., a combined low-income, spend- and-save target) that was more burdensome than that required of Pepco by the PSC (which has only a spend target).[3]

In 2021, the Board also participated in proceedings before the PSC (which has oversight over the utilities' programs). To this end, the Board notes that the forces impacting the DCSEU no longer reside only in the Council and DOEE, but now also involve the PSC. The Board has a formal role in the process leading to PSC approval of Pepco's programs[4] and will be included in a Technical Issues Working Group to be formed by the PSC, which will seek to ensure coordination.[5] The Board requested DOEE's and PSC's assistance in ensuring that the Board is up to speed on additional PSC proceedings that may have bearing on the DCSEU's role.

The DCSEU will also be facing challenges that are arising externally, such as increased national regulatory energy savings requirements and the District's green construction codes that diminish the "incremental" savings the DCSEU can claim result from its investments. For example, the DCSEU was able to help residents and businesses obtain significant energy savings by providing rebates and incentives to these entities to encourage the installation of energy-efficient lighting. The DCSEU achieves energy savings for these installations. However, as the Biden Administration increases the stringency of required energy efficiency standards for lighting, the amount of incremental savings the DCSEU can claim will necessarily be reduced. To that end, the Board expects to assist the DCSEU in exploring new savings opportunities against a changing policy, regulatory, and market environment. At the same time, the Board also expects that in 2022, it will seek to assist the DCSEU in obtaining the benefits to be enjoyed as a result of federal spending pursuant to the federal bipartisan once-in-a-generation investment in infrastructure and clean energy.

In 2021, the Board also attempted to mitigate some structural challenges, particularly, lengthy periods for the appointment of replacement Board members, which resulted in extended periods of time in which the Board was required to operate with fewer than its full complement of Board members (and therefore increased responsibilities on remaining members). The Board recognizes that the pandemic may have contributed to the delays experienced in 2021 and looks forward to working with the Mayor's Office of Talent and Appointments to seek to determine how these periods may be shortened. The Board voted and approved an amendment to the Board's attendance bylaws (details provided in the appendix). Table 1 in the appendix shows current Board members, their term end dates, and the number of meetings attended. Note, the Board has three vacant openings for a Building Construction Industry representative, an

[3] The DCSEU's data showed that the spending/savings target did not significantly "move the needle," in terms of effectuating additional energy savings achieved as a result of DCSEU's expenditures; and indeed, had the unintended consequence of steering the DCSEU's savings away from buildings where building owners had less funds to contribute, i.e., the buildings most in need of the DCSEU's assistance.

[4] D.C. Official Code § 8-1774.07(g)(4).

[5] Formal Case No. 1160, Order No. 21076, issued December 8, 2021.

Appointee of the Chairman of the Council of the District of Columbia, and a Washington Gas representative. DOEE, the Board, and Council are working together to fill these vacant positions.

The Board applauds the DCSEU's excellent performance in 2021, particularly considering the ongoing challenges posed by the second year of COVID-19. The DCSEU achieved or well-exceeded all its minimum and maximum performance benchmarks. The Board also notes that the DCSEU will be transitioning to new leadership in calendar year 2023, due to the retirement of Ted Trabue, DCSEU's Managing Director since its inception. The Board thanks Ted for his service of over ten years, bringing the DCSEU from infancy to the successful state it is today. The Board looks forward to working with the DCSEU in determining how to facilitate its achieving and exceeding all its targets, and to its continued success in contributing to energy savings, equity, and now greenhouse gas reductions, in the District.

2. Summary of 2021-2022 Activities and Priorities

2.1. Key Activities of the DCSEU in FY21 into FY22

As outlined in the Clean and Affordable Energy Act of 2008, D.C. Official Code § 8-1774.03[6] (CAEA), the Board is charged to provide advice, comments, and recommendations to DOEE and the Council regarding the procurement and administration of DCSEU, advise on DCSEU performance and monitor DCSEU under their contract.

The Board met fifteen times in FY22, including two special meetings. All FY22 convenings were held virtually via Microsoft Teams. Table 1 in the appendix lists current Board members, their term end dates, and the number of meetings attended. Note, three Board members (Jamal Lewis, Mishal Thadani, and Sasha Srivastava) joined in November 2021, and DOEE is working to find eligible applicants to fill the vacant seats. The three vacant seats are for a Building Construction Industry representative, an Appointee of the Chairman of the Council of the District of Columbia, and a Washington Gas representative.

2.1.1. Overall Context

The DCSEU is charged to administer sustainable energy programs in the District, including the development, coordination, and provision of programs to promote the sustainable use of energy in the District. More specifically, the DCSEU aims to reduce energy consumption, increase renewable energy generating capacity, increase the number of green-collar jobs in the District, and improve the energy efficiency and increase the renewable energy generating capacity of low-income housing, shelters, clinics, and other buildings serving low-income residents. The DCSEU contract is performance-based and provides financial incentives for the Contractor, Vermont Energy Investment Corporation (VEIC), to meet or exceed the required performance benchmarks and financial penalties if the Contractor fails to meet the required performance benchmarks. Several of the programs discussed throughout this document, such as the Solar for All (SFA) program and the Affordable Housing Retrofit Accelerator (AHRA), are not subject to performance benchmarks.

[6] "CAEA," D.C. Law 17-250, effective Oct 22, 2008, D.C. Official Code §8-1773.01 et seq.

The DCSEU operates on a five-year contract period. FY21 was the final year of a five-year contract period. In FY21, the DCSEU had a total budget of $29,909,034 with $19,098,333 from Sustainable Energy Trust Fund (SETF), $10,460,701 allocated for SFA from the Renewable Energy Development Fund (REDF), and an additional $350,000 for the Sustainable Energy Infrastructure and Capacity Building Pipeline (Train Green SEICBP) program. In FY22, the DCSEU contract was renewed, starting another five-year cycle (FY22-FY26). The renewed contract prioritizes greenhouse gas (GHG) reduction, building decarbonization, electrification, and renewable energy generation in the District.

2.1.2.Key Programs under the SEU Contract

In FY21, the DCSEU implemented 24 different programs across the commercial, solar, residential, and low-income industries. Key initiatives included the Commercial and Institutional (C&I) Customer program, SFA program, Income Qualified Efficiency Fund, Train Green SEICBP workforce development program, Low-Income Energy Kits, Business Energy Rebates, and residential Efficient Products program. Most of these programs are funded in the core SETF contract, though SFA and SEICBP are funded by specific sections of the DCSEU contract that were incorporated through contract amendments.

2.1.3. Programs not under DCSEU Performance Benchmarks

2.1.3.1. Solar for All

SFA aims to provide low-income DC residents with the benefits of solar electricity. The program was established by the Renewable Portfolio Standard (RPS) Act of 2016 and is funded by REDF. Upon enrolling in SFA, an installed system will offset the homeowner's electricity costs by about $500 per year. Renters who meet income requirements are also eligible for the community solar part of the program if they agree to the terms and conditions. Once a homeowner is qualified, the system is installed at no cost and is funded by the DCSEU through SFA. SFA operates on a first-come, first-served basis and fulfillment is dependent upon funding availability.

Between FY19-FY21, the DCSEU installed 21.827 megawatts (MW) of solar capacity through SFA. In FY21, the DCSEU installed 122 single-family solar systems and 23 community renewable energy facilities (CREF) that will serve more than 1,600 income-qualified households through SFA's community solar part of the program.

In FY22, $14.5 million in SFA funding was budgeted for the DCSEU, which included an additional $250,000 to make roof repairs, a significant barrier to many residents in past years. The DCSEU is expected to complete approximately 40 CREFs and 100 single-family installations by the end of FY22 and the beginning of FY23. This additional solar energy capacity is estimated to serve an additional 2,700 income-qualified District households.

2.1.3.2. Affordable Housing Retrofit Accelerator

On December 8, 2021, the DCSEU launched the Affordable Housing Retrofit Accelerator (AHRA) which offers enhanced technical and financial assistance to owners and managers of qualifying affordable multifamily buildings that do not meet the District's Building Energy Performance Standards (BEPS).

AHRA helps participants:

- Understand the BEPS and how they apply to affordable housing properties;
- Uncover energy-saving opportunities in their building(s);
- Identify resources, including financial incentives and financing opportunities, to help pay for upgrades that will reduce energy use;
- Choose a Compliance Pathway[7] and get support towards compliance with the BEPS requirements as determined by DOEE; and
- Preserve affordable housing, cut your energy costs, run buildings more efficiently, and reduce overall greenhouse gas emissions.

In FY22, DCSEU conducted energy audits and provided technical support for the Department of Housing and Community Development's (DHCD) pipeline of Low-Income Housing Tax Credit (LIHTC) buildings, and AHRA-eligible buildings. The DC Green Bank (DCGB) developed a new AHRA loan product to deploy funds for energy retrofits. Four full-time employees were hired at DOEE to support AHRA implementation. The BBC filmed a documentary on AHRA which aired at the international C40 conference in October 2022.[8]

The AHRA program will continue in FY23.

2.1.4.Innovation

The DCSEU has discretionary funding every year for piloting "innovation" projects that aren't governed by contract benchmarks. In FY20, the DCSEU received funding to implement the Low Income Decarbonization Pilot (LIDP) program. The goal of the LIDP was to obtain data on the total costs, benefits, challenges, resident impact, and cost-effectiveness of beneficial electrification (BE)[9] and other forms of decarbonization[10] from installing BE measures in income-qualified homes.

In FY22, DCSEU provided funding and technical support to renovate a home through the Net Zero Energy Program, a partnership between the DCSEU and the Department of Consumer and Regulatory Affairs (DCRA). This home was featured in a Washington Post article for its approaches to high efficiency "passive house" construction and design.[11]

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[7] Building Innovation Hub. BEPS Compliance Pathway Timelines. https://buildinginnovationhub.org/resource/regulation-basics/understanding-beps/beps-compliance-pathway-deadlines/

[8] BBC StoryWorks. No Place Like Home. https://www.bbc.com/storyworks/transforming-cities/washington-dc

[9] Beneficial electrification (or strategic electrification) is a term for replacing direct fossil fuel use (e.g., propane, heating oil, gasoline) with electricity in a way that reduces overall emissions and energy costs. There are many opportunities across the residential and commercial sectors. Environmental and Energy Study Institute. https://www.eesi.org/electrification/be#:~:text=Beneficial%20electrification%20(or%20strategic%20electrification,the%20residential%20and%20commercial%20sectors.

[10] What is decarbonization? TWI Global. https://www.twi-global.com/technical-knowledge/faqs/what-is-decarbonisation

[11] Moody, C. Renovation with a Purpose: A D.C. Home Gets a Big Eco-Friendly Overhaul. *The Washington Post*. September 14, 2022. https://www.washingtonpost.com/magazine/2022/09/14/net-zero-home-renovation-washington/.

2.1.5.Engagement

During FY21, the DCSEU was involved in numerous marketing and outreach activities. While the team's in-person outreach opportunities were still limited by the COVID-19 pandemic, the DCSEU slowly began arranging and attending in-person events during the summer months. The DCSEU was able to take advantage of virtual events to continue engagement with different communities and market segments throughout the pandemic. The DCSEU's marketing and outreach work included the following:

- **Supported the development and launch of the Sustainable Energy Infrastructure and Capacity Building Pipeline (Train Green SEICBP) program and trade ally outreach**. The DCSEU issued a press release and developed a flyer for use in promoting the program during the summer, developed a pre-registration process to avoid delays in promoting the program, and updated the website and registration process for when courses became available. The DCSEU worked closely with the Department of Small and Local Business Development (DSLBD) and the Coalition for Nonprofit Housing and Economic Development (CNHED) to promote the program to Certified Business Enterprise (CBE) contractors and firms in the city, as well as to DC residents who work for non-CBE firms. Numerous email marketing blasts were sent to the DCSEU's network. More than 200 people registered for a course this year.
- **Developed a commercial refrigeration campaign offer and created marketing materials, a web presence, and marketing tactics for promoting the campaign.** The team placed ads through LinkedIn and the Restaurant Association of Metropolitan Washington and promoted the offer through organizations like Think Local First, DSLBD, and Main Streets programs.
- **Developed an Account Management Lead Generation campaign to drive new customers and potential project leads to the Account Managers**. Customers are now able to book a meeting directly with an Account Manager for their vertical market without having to call or send an email.
- **Continued outreach for the SFA Single-Family program.** The DCSEU continued outreach for the SFA Single-Family program and placed advertising on Google Ads to potential income-qualified customers to sign up for the opportunity to have solar installed on their home at no cost. The DCSEU also reached out to the community through Nextdoor posts.
- **Continued outreach to income-qualified residents through the DCSEU's Food Banks and Income-Qualified Energy Kit offerings**.
- **Continued the DCSEU's partnership with the DC Public Service Commission, Office of the People's Counsel, and DOEE on the "Here2HelpDC" campaign**. The DCSEU worked closely with these organizations to reach out to communities and inform them about utility cutoff moratoriums and when they would end, as well as programs that could assist them with paying their utilities and cutting their energy bills, long-term.
- **Pursued public relations opportunities for SFA during the summer and fall as projects are underway or receive authorization to operate (ATO).** This included planning a ribbon cutting, press release, and media outreach at Children's National Research and Innovation Campus (RIC)

that received several media hits (the DCSEU's first in-person event since the pandemic began), supporting a segment with NBC 4 in late-June at a community solar project at the Washington Tennis and Education Foundation, and receiving recognition for SFA (DOEE and the DCSEU) during a national CBS Saturday Morning segment.

- **Worked with Pepco and DOEE on the Reduce Energy Use DC campaign.** This included producing a video and other content for the campaign, as well as facilitating an "Energy Break" webinar panel on the topic of Workplace and Small Business Sustainability.
- **Launched a residential Summer Sweepstakes campaign to residential customers**. The campaign ran from July-August and offered opportunities to win an ENERGY STAR appliance or a smart thermostat by either purchasing a DCSEU Home Energy Conservation Kit or entering to win on the DCSEU website.
- **Worked on a Strategic Energy Management (SEM) program and distributing an SEM toolkit to DC universities**. The DCSEU completed its SEM cohort of universities in the third quarter. During Q3, the DCSEU distributed an "Energy Efficiency on Campus Engagement Toolkit" to participants that included materials and guidance to encourage staff and students to engage in energy-saving behaviors.
- **Hosted roundtable discussion events with different commercial, institutional, and multifamily vertical market customers.** The DCSEU hosted roundtable discussions for K-12 schools and for affordable multifamily property owners and managers in partnership with the Building Innovation Hub.

The DCSEU also participated in several virtual and in-person events during FY21 including:

- Housing Association of Nonprofit Developers (HAND) Annual Meeting in June– virtual exhibitor
- BISNOW Mid-Atlantic Health Care Summit in July - attendee
- BISNOW Affordable Multifamily Housing Summit in August – in-person exhibitor
- DC Clean Energy Summit hosted by the PSC in September – in-person exhibitor and speaker

During FY 2022, the DCSEU continued efforts to get back into the community as pandemic restrictions eased. These efforts included:

- **Residential Market (including income-qualified residents)**: The DCSEU launched rebates for electric leaf blowers and lawn mowers, and launched a corresponding advertising campaign, including ads and outreach in Spanish. With the likelihood that rebates for residential LED lighting ending in FY 2023, the DCSEU also launched a lighting advertising campaign to drive customers to purchase discounted LEDs in participating retail outlets. There was a continued push for energy conservation kits as well, which are offered at no cost to income-qualified residents and can be purchased for just $10 for all DC residents. For income-qualified customers, the DCSEU continued outreach for single-family SFA combined with efforts to drive customer leads

for the HVAC Replacement program. This included launching a direct mail campaign late in FY 2022 to drive awareness and leads for FY 2023.

- **Commercial, Institutional, and Multifamily Market**: For Commercial and Institutional (C&I) and multifamily customers, the DCSEU concentrated on reaching out to these markets to ensure they were informed about BEPS requirements and how the DCSEU could support them. This included hosting multiple virtual roundtable events with different vertical markets in partnership with the Building Innovation Hub.
- **Contractor Outreach:** The DCSEU continued its work to promote the Train Green SEICBP program, working collaboratively with DSLBD, CNHED, and other partners to promote the program to CBEs, CBE-eligible firms, and DC residents. This included eblasts to our contractor list and shared media opportunities with partners through their newsletters and social media. The DCSEU also focused on identifying potential new CBE contractors that could potentially work on DCSEU programs, which included working with DSLBD's Procurement Technical Assistance Center (PTAC) team on a CBE Green Rally event in March 2022.
- **Affordable Housing Retrofit Accelerator**: In FY 2022, the DCSEU stood up the Affordable Housing Retrofit Accelerator. For outreach, the DCSEU created and launched a new logo, web page, web form application, and promoted and ran a training webinar for the Affordable Housing Retrofit Accelerator.
- **SFA Community Solar**: For SFA Community Solar, the DCSEU completed the production of a video featuring a SFA Community Solar installation in Ward 4 along with the DC Green Bank, Flywheel Development, and SunStyle, a solar shingle manufacturer. This included a video shoot onsite with Councilmember Janeese Lewis George. The DCSEU also hosted a ribbon cutting event and distributed a press release to celebrate the project and the video. The project received media hits from Next City and Net Zero Insider. The DCSEU also installed signage at SFA Community Solar sites to raise awareness about the program.

Overall, the DCSEU received 268 earned media hits[12] in FY 2022. FY 2022 Outreach Events Highlights are included in Appendix

2.1.6.Strategic Plan

As the DCSEU begins its new five-year contract term, it was charged by the Board with creating a new Strategic Plan for FY22-FY26. The Board reviewed the final draft of this plan and provided feedback to DCSEU and DOEE that was incorporated into the final plan.

The strategic plan orients the DCSEU around achieving three complementary goals, as shown in Figure 1.

[12] Earned Media. *Influencer Marketing Hub*. https://influencermarketinghub.com/glossary/earned-media/

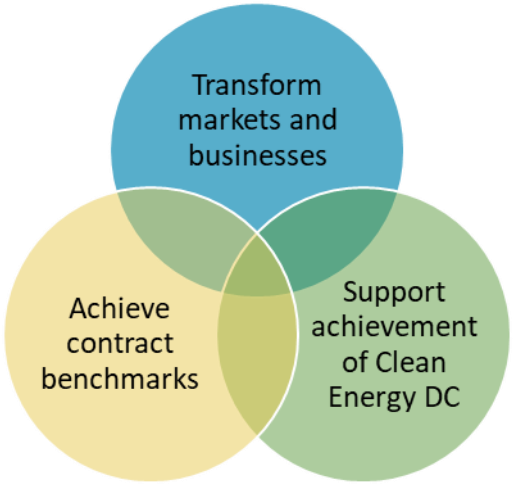


Figure 1: Three overlapping actions that will positively affect the next five years of sustainable energy delivery

To support this, the plan outlined several key objectives:

- Delivering consistent, cost-effective energy savings, particularly electricity savings, and shifting customers away from fossil fuel use and consumption;
- Generating significant reductions in GHG emissions; and
- Providing commercial and multifamily building owners and managers with tailored services that meet their needs for BEPS compliance.

The strategic plan presents a pathway to achieving the energy and GHG performance benchmarks of the new five-year contract, but it also makes clear that the base contract funding is insufficient to meet these benchmarks, and that additional funding or leveraged funds from federal sources, PJM, and additional contracts will be critical to closing the gap.

2.2.Looking Forward

Looking forward to FY23, and beyond, the DCSEU faces a dramatically changed landscape and new opportunities and challenges. The Board will focus on the following areas in FY23:

1. **Evaluate goals and benchmarks:** The board has a statutory obligation to monitor the performance of the DCSEU, pursuant to its contract and provide recommendations to DOEE for improvements. The DCSEU now has several new performance benchmarks, including a GHG reduction benchmark and a fuel-neutral energy savings benchmark, both of which the Board advocated for. The Board will continue to monitor the DCSEU's performance and recommend adjustments, if needed.
2. **Support DCSEU through transitions**: In July 2022, Ted Trabue retired as Managing Director of the DCSEU, and VEIC is actively searching for a new Managing Director for the DCSEU. The Board thanks Ted for his over ten years of service, bringing the DCSEU from infancy to the

successful state it is today. The Board will work with VEIC and DOEE to support the selection and onboarding of the new Managing Director.

3. **Interaction with utility programs**: The Clean Energy DC Omnibus Amendment Act of 2018 (CEDC Act)[13] clarified that Pepco and Washington Gas could apply to operate energy efficiency and demand response programs (EEDR) in the District alongside the DCSEU. As stated in the statute, the electric company or gas company are required to demonstrate that their EEDR offerings *are not substantially similar to programs offered or in development by the SEU, unless the SEU supports such programs*. Pepco filed with the PSC for approval of a suite of EEDR programs, and the PSC approved a substantial portion of them. The DCSEU and Pepco worked to identify the market segments each would engage to limit competition between the two entities, and the Board advised on this separation. However, the existence of multiple energy efficiency programs with different brands in DC will unavoidably introduce confusion in the marketplace among consumers. The Board will continue to advocate for the DCSEU's and the District's energy users interests in this space, including through the Board's involvement on the Technical Issues Working Group. However, this working group will not have any governance role. In several other jurisdictions with multiple entities offering energy efficiency services, a single authority typically oversees all programs, which is not the case in the District.
4. **New funding opportunities:** The increased federal funding provided through the Bipartisan Infrastructure Bill[14] and the Inflation Reduction Act[15] is changing the landscape for energy efficiency and renewable energy implementation in the United States. Some of these funds will come to the District through block grants, but others will require competitive applications. These federal funds represent the largest potential additional funding source for DCSEU programs. As the State Energy Office, DOEE is ultimately responsible for securing federal money for DCSEU programs; however, but the Board can work with DOEE and DCSEU to identify potential opportunities and support their application.
5. **Support DCSEU's involvement in existing Building Energy Performance Standard (BEPS) compliance:** BEPS will drive major new investment in energy efficiency in large buildings in the District and will be a major driver of DCSEU commercial program uptake over the next five years. That said, this tailwind is meeting the headwinds of rising inflation, slowing economic growth, and continued shifts in downtown space utilization resulting from the pandemic. In addition, the DCSEU is tasked with running the Affordable Housing Retrofit Accelerator (AHRA, as discussed above) in partnership with the DC Green Bank and DOEE to support affordable housing buildings meeting BEPS. While the AHRA is not funded through the SETF, it is a critical DCSEU program and makes up a large portion of the total DCSEU budget for FY23. As the Board seeks to advise on all DCSEU programs, not just those funded through the core SETF contract, monitoring the successes and challenges of AHRA will be important.

6. **Help the DCSEU to address the challenges in meeting their performance benchmarks posed by the increased federal and local energy efficiency standards:** The Council recently passed

[13] "CEDC Act," D.C. Law 22-257, effective Mar. 22, 2019.
[14] Bipartisan Infrastructure Law. Public Law 117-58, passed Nov. 15, 2021.
[15] Inflation Reduction Act. Public Law No: 117-169, signed into law Aug. 16, 2022.

the Climate Commitment Act of 2022[16] which codifies the commitment for the District to achieve carbon neutrality by 2045, and the Clean Energy DC Building Code Amendment Act[17] of 2022 to move the energy codes to net-zero and all-electric new construction by 2026 or sooner, which is a positive step but will also impact the new construction savings available to be claimed by DCSEU. Moreover, the federal lighting standards that eliminate old inefficient incandescent lighting have raised the baseline for lighting performance, meaning that the DCSEU will now see much smaller incremental energy savings from its lighting measures. This trend is likely to continue in other areas as federal appliance and equipment standards improve.

3. Legislative, Regulatory, and Contract Changes

3.1. Contract Changes

FY21 represented the final year of the five-year base period of the DCSEU contract with DOEE, which consisted of a cost reimbursement ceiling plus a fixed fee. The DCSEU contract also included at-risk compensation for meeting or exceeding performance benchmarks, and penalties for not meeting the performance benchmarks. DOEE did not execute any major changes to the DCSEU contract in FY21, except for those administrative changes that were necessary to update the cost schedule to ensure proper administration of the contract. However, DOEE collaborated with the Board and other public stakeholders to make significant changes to the five-year option period of the DCSEU Contract (FY22-FY26) prior to the execution of the option period. The changes include:

1) Restricting the DCSEU's ability to incentivize natural gas measures without explicit written approval from DOEE;
2) Switching to a MMBtu metric for measuring annual and cumulative reductions in energy consumption in the District, instead of separate metrics for measuring reductions in electricity consumption and reductions in natural gas consumption as specified in the five-year base period;
3) Adding a performance benchmark to measure annual and cumulative reductions in GHG emissions;
4) Increasing the annual amount of mandatory DCSEU expenditures of programs and initiatives that support the District's low-income residents;
5) Eliminated the performance benchmark that required the DCSEU to obtain funds from non-District government sources to support energy efficiency and renewable energy projects;
6) Eliminated the performance benchmark that required the DCSEU to reduce the growth in energy demand for the District's largest energy users; and
7) Adding a performance benchmark to require the DCSEU to design and implement a deep energy retrofit program that provides technical and financial incentives to commercial and

[16] Climate Commitment Amendment Act of 2022. D.C. Law 24-176, effective Sept. 21, 2022.
[17] Clean Energy DC Building Code Amendment Act of 2022. D.C. Law 24-177, effective Sept. 21, 2022.

multifamily residential building owners that are required to comply with BEPs to substantially reduce their building's annual energy consumption.

3.2. Legislative and Regulatory Changes Impacting the DCSEU

The Board tracks legislation that may impact the DCSEU. The following bills of relevance to the DCSEU were enacted during Council period 24:

Fiscal Year 2023 Budget Support Act of 2022 (FY2023 BSA), D.C. Law L24-167, effective September 21, 2022.

This act made several changes to the Renewable Energy Development Fund (REDF, DC Code § 34-1436) and the Sustainable Energy Trust Fund (SETF, DC Code § 8-1774.10):

1) Sections 6021-6022 of the FY2023 BSA, titled the "Climate Change Resilience Expenditure Authority Amendment Act of 2022," authorizes the use of the REDF for projects or programs that increase climate change resilience in the District, provided that each such project or program includes a solar energy component or uses solar energy generated in the District.

2) Sections 6041-6042 of the FY2023 BSA, titled "Green Finance Authority Board Amendment Act of 2022," prohibits the DC Green Finance Authority (DC Green Bank) from funding fossil fuel projects and programs for applications received by the DC Green Bank after September 30, 2022.

3) Sections 6051-6052 of the FY2023 BSA, titled "Sustainable Energy Trust Fund Amendment Act of 2022," expands the allowable uses of SETF to include projects and programs that increase climate change resilience in the District through the use of sustainable energy resources, including infrastructure and structural improvements and energy storage devices or equipment. These sections also authorize the expenditure of at least $600,000 from the SETF in Fiscal Years 2023 – 2025 for grants supporting the installation of energy storage systems connected to renewable energy generation systems in the District this storage program may be administered by DOEE or the DCSEU. Also, the grant program will have a preference for energy storage systems connected to solar installations supported by through SFA or connected to a facility that supports the District's resilience action plans and strategies.

B24-0267 Climate Commitment Amendment Act of 2022, D.C. Law L24-176, effective from Sep 21, 2022

This act commits the District to achieve carbon neutrality by 2045 with interim targets in 2025, 2030, 2035, and 2040. District government operations must reach carbon neutrality by 2040 and prioritize actions that result in additional renewable energy generation. Further, the act prohibits the District government from installing natural gas, oil, or other fossil fuels, natural gas space- or water-heating appliances in District-owned buildings beginning January 1, 2025 (except where infeasible). The law

establishes a task force of District Government and DC Water officials to create an action plan for the 2040 neutrality target; DOEE must prepare and submit an annual report to Council.

B24-0420, Clean Energy DC Building Code Amendment of 2022, D.C. Law L24-177, effective from Sep 21, 2022

This act amends Green Building Act of 2006[18] to require the District to adopt net zero energy (NZE) regulations for new buildings and substantial improvements by December 31, 2026. The act defines a "net-zero energy standard that mandates the use of onsite renewable energy first, then buildings can procure renewable energy through offsite sources, but unbundled renewable energy credits are not eligible to satisfy the renewable generation requirement. Finally, the act requires the newly established Department of Buildings to conduct an independent audit of a sample of buildings that received certificates of occupancy every three years.

3.3. PSC Cases Impacting the DCSEU

PSC Formal Case No. 1160 (FC 1160): *In the Matter of the Development of Metrics for Electric Company and Gas Company Energy Efficiency and Demand Response Programs Pursuant to Section 201 (b) of the Clean Energy DC Omnibus Amendment Act of 2018.*

FC 1160 is the proceeding that is considering Pepco's application to administer energy efficiency and demand response (EEDR) programs in the District under Section 201 (b) (D.C. Code § 8-1774.07) of the Clean Energy DC Omnibus Amendment Act of 2018 (CEDC Act, D.C. Law 22-257, effective March 22, 2019). Section 201 (b) of the CEDC Act also established a working group (EEDR WG) to recommend long-term and annual energy savings metrics, quantitative performance indicators, and cost-effective standards for utility EEDR programs. Pepco filed its application to administer EEDR programs on August 2, 2021.

In Order Nos. 20654 and 21030, the PSC adopted many of the recommendations in the EEDR WG's reports filed in this proceeding. However, with respect to the recommendation of several working group members for the formation of a formal governance body and framework to help facilitate the implementation of programs, provide a process for resolving coordination challenges and inconsistencies, and identify opportunities for enhanced coordination between Pepco and the DCSEU, the PSC held that a separate formal governance board was not necessary and directed the EEDR WG "to reconvene and meet every six (6) months from the program implementation date to address/resolve any challenges and to discuss new opportunities or desirable changes that may have arisen during the six-month program implementation." (Order No. 21030 at pg. 16).

On November 8, 2021, DOEE filed its *Motion for Reconsideration and Modification of Order No. 21030*. DOEE argued that coordination of EEDR programs administered by Pepco and the DCSEU was essential

[18] D.C. Law 16-234, effective March 8. 2007, D.C. Official Code § 6–1451.01 et. seq.

to ensure Pepco's programs are complementary, and not competitive, to the DCSEU's programs and that a meeting only every six months was too infrequent to address the multiple complex technical matters.

On November 15, 2021, the Board filed its *Response in Support of the Department of Energy and Environment's Motion for Reconsideration and Modification of Order No. 21030* (Attachment 1). In its response, the Board stated that it "has a strong interest in ensuring the continued vitality of the DCSEU, especially at this critical juncture – when the District's utilities will be augmenting the numbers and types of clean energy services they are also delivering to District ratepayers." (Board Response at p. 2). Further, "[t]he Board believes it is essential that it, the DCSEU, DOEE, PSC, OPC, and interested stakeholders, have visibility into the roll-out and implementation of the utilities' programs … [and t]he Board agrees with DOEE that bi-annual EEDR WG meetings are too infrequent to allow the parties to be able to ensure that the array of EEDR programs offered by multiple providers are complementary." (Board Response at p. 2).

On December 8, 2021, the PSC issued Order No. 21076 granting DOEE's Motion and establishing a Technical Issues Group (TIG) that is a subgroup of the EEDR WG; the TIG will be comprised of PSC Staff, OPC, Pepco, Washington Gas, Apartment and Office Building Association of Metropolitan Washington (AOBA), DOEE, a member of the DCSEU, and a member of the DCSEU Advisory Board. The TIG is tasked with discussing "discreet technical issues [, which] may be helpful and efficient in resolving any technical issues during the implementation of the utilities' energy efficiency programs." (Order No 21076 at p.4).

For Pepco's proposed EEDR programs, the PSC also invited interested parties to file comments on the proposed suite of programs. On November 23, 2021, the DCSEU filed its comments (see Attachment 2), which emphasized the need to avoid duplication and harm to existing markets as well as alignment of incentives and ongoing coordination between the DCSEU and Pepco programs. The DCSEU also submitted specific comments on each program proposed by Pepco and made recommendations to address concerns about duplication and harm to existing markets.

On August 11, 2022, the PSC issued Order No. 21417, granting in part Pepco's application to administer EEDR programs and approving a modified suite of programs. Pepco filed an *Application for Reconsideration and Clarification* of Order No. 21417 on September 12, 2022. DOEE filed a Motion for Limited Clarification of Order No. 21417 on September 13, 2022. On October 13, 2022, the PSC rescinded Order No. 21417 and will issue a revised order.

On October 31, 2022, Washington Gas filed its Energy Efficiency and Demand Response (EEDR) Potential Study. Prior to submitting program proposals to the PSC, Washington Gas shall consult with the DCSEU Advisory Board and others prior to formally submitting EEDR proposals to the PSC for approval, as required by statute.

PSC Formal Case No. 1167 (FC 1167)*: In the Matter of the Implementation of Electric and Natural Gas Climate Change Proposals.*

On November 18, 2020, the PSC issued Order No. 20662 which opened a new climate policy proceeding to consider whether and to what extent Pepco and Washington Gas are advancing the District in meeting its aggressive energy and climate goals. On June 4, 2021, the PSC issued Order No. 20754 directing Pepco to file a detailed plan to meet its climate change commitment ("Climate Solutions Plan") and several other plans relating to the Climate Solutions Plan and WGL to file 5-year and 30-year climate change plans and supporting documentation. The PSC also invited interested parties to file comments on the filings. Order No. 20754 also directed stakeholders to inform the Commission regarding whether they would be filing electrification studies and the timing of those filings.

On May 11, 2022, the DCSEU filed comments on Sierra Club's electrification study, which was filed on March 11, 2022. Please see Attachment 5 for the full text of the DCSEU's comments.

On June 10, 2022, and September 16, 2022, the DCSEU submitted initial and reply comments, respectively, on Pepco's detailed Climate Solutions Plan and related filings. Please see Attachments 3 and 4 for the full text of the DCSEU's comments.

4. Performance Review, FY21

The Board applauds the DCSEU's excellent performance in FY21, particularly in light of it occurring in the midst of the challenges posed by the second year of COVID-19. FY21 represented the final year of DCSEUs prior five-year contract. The DCSEU achieved or well-exceeded all its minimum and maximum performance benchmarks—particularly notable given that this was the final year for its cumulative targets under the contract, and that the expected performance increased non-linearly in the final year.

The Board has streamlined the presentation of the FY21 performance, highlighting the key achievements and lessons learned. Readers interested in a more detailed review of all performance benchmarks and their elements should refer to the *DCSEU FY2021 Performance Benchmarks Report*[19] produced by NMR Group, Inc. (NMR) for DOEE in August 2022, which is attached as an appendix to this report.

As shown in Table 1, from the NMR Report, FY21 was the best year of achievement for the DCSEU, achieving all benchmarks for the first time:

[19] NMR Group, Inc. DCSEU FY2021 Performance Benchmarks Report. August 11, 2022. https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/DCSEU%20FY2021%20Performance%20Benchmarks%20Report%20FINAL%2008.11.2022.pdf

Table 1: DCSEU Performance Over 5 Years

Benchmark Type	Benchmark	FY2017		FY2018		FY2019		FY2020		FY2021	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Annual Cumulative Target	1. Electricity Savings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	2. Natural Gas Savings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	3. Renewable Energy Generating Capacity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Annual Target	4a. Low-income Expenditures	✓	*n/a*	✓	*n/a*	✓	*n/a*	✓	*n/a*	✓	*n/a*
	4b. Low-income Savings	✓	X	✓	X	✓	X	✓	X	✓	✓
	5. Green-collar Jobs	✓	X	✓	X	✓	X	✓	✓	✓	✓
Five-year Cumulative Target	6. External Funds	18%	9%	28%	14%	41%	21%	✓	61%	✓	✓

4.1.Energy and Emissions Performance

4.1.1.Electricity Savings

In FY21, the DCSEU achieved both the minim and maximum targets for both electricity and gas savings. These five-year cumulative targets were set based on 2014 energy consumption numbers. Table 1 shows the performance against the electric and gas savings benchmarks. Table 2 and 4 show the cumulative savings over five years. For reference, both electricity and gas savings have also converted into the same units, MMBtu, for comparison (these conversions are unit conversions at site, and do not account for any generation, transmission, or distribution losses).

In FY21, the DCSEU did not modify its annual savings goals, although, the effects of the pandemic were contemplated.

The DCSEU exceeded the maximum cumulative target for reducing electricity savings in FY21. The maximum target was 576,485 MWh and the cumulated achievement actual was 592,311 MWh.

The DCSEU's realization rates, per NMR, reflect stability, with a range from 97% to 103% for electric savings and from 95% to 105% for peak demand savings. In reviewing the *Pay for Performance* track and the *Commercial Custom Retrofit* track, NRM noted that the accuracy of tracked savings could be improved. NMR provided recommendations for consideration.

Table 2: Electricity Savings

Year	Evaluated Savings, Annual (MWh)	Evaluated Savings, Cumulative (MWh)	Percent of Five-Year Target	Evaluated Savings, Annual (Site MMBtu)	Evaluated Savings, Cumulative (Site MMBtu)
FY17	92,686	92,686	**16%**	316,245	316,245
FY18	134,728	227,414	**39%**	459,692	775,937
FY19	151,321	378,735	**66%**	516,307	1,292,244
FY20	109,368	488,103	**85%**	373,164	1,665,407
FY21	104,228	592,331	**103%**	355,626	2,021,033
Total	**592,331**	**592,331**	**103%**	**2,021,033**	**2,021,033**

The DCSEU's performance over a five-year period reflects ongoing progress, with evaluated cumulative savings, annually. Of note, the percent of the five-year target moved from 16% in FY17 to 103% in FY21, resulting in cumulative evaluated savings of 592,331 MWh.

Electricity Sales

In 2021, the District of Columbia experienced a 1.8% increase in total electricity sales from the previous year, adjusting for the weather. This is a marked difference from 2020, where total sales fell 8.0% likely due to the COVID-19 pandemic.

Residential sales slowed in 2021, growing by 0.7% compared to 2.0% growth in 2020. This is alongside a 2.3% increase in the number of residential customers, which suggests a 1.6% decrease in kilowatt hour (kWh) consumption per customer.

Commercial sales increased 2.6% in 2021 but remain well below pre-pandemic levels. The number of commercial customers has stayed relatively consistent, with 0.7% and 0.6% growth in 2020 and 2021 respectively. Ultimately, the District is still adjusting to post-pandemic life, and may yet see a new baseline in commercial electricity consumption.

Table 3: Electricity Sales, 2019-2021

Year	Residential Weather Normalized Sales (MWh)	Commercial Weather Normalized Sales (MWh)	Total Weather Normalized Sales (MWh)
2019	2,490,857	7,916,002	10,406,859
2020	2,541,342	7,012,093	9,553,435
2021	2,558,070	7,195,674	9,753,744

2022 and 2023 provide significant opportunities for the District to advance programs and initiatives that will result in a cleaner and more resilient future for District residents. Recently, the PSC approved a suite of utility programs to complement the work of the DCSEU. DOEE, the DCSEU, and Pepco will continue to work collaboratively, as these programs are implemented. Federal funding, through President Biden's Bipartisan Infrastructure Law[20] and the Inflation Reduction Act[21], provide unprecedented opportunities to advance the goals of the District further.

4.1.2. Gas Savings

While there was a reduction in savings in FY21 compared to the previous three years, the DCSEU still exceeded the Performance Benchmark maximum cumulative target for natural gas savings during the five-year contract period. These savings are equivalent to a total of 15,900 households worth of gas consumption.

The lower savings in FY21 could be a result of lower gas prices in 2021, typically a major indicator of consumption trends. Recent volatile gas prices will likely have an impact on gas consumption trends, and therefore future savings.

Table 4: Gas Savings Progress Over 5 Years

Year	Evaluated Savings, Annual (Therms)	Evaluated Savings, Cumulative (Therms)	Percent of Five-Year Target	Evaluated Savings, Annual (Site MMBtu)	Evaluated Savings, Cumulative (Site MMBtu)
FY2017	1,998,033	1,998,033	**20%**	199,803	199,803
FY2018	2,237,961	4,235,994	**41%**	223,796	423,599
FY2019	2,569,795	6,805,789	**67%**	256,980	680,579
FY2020	2,211,174	9,016,963	**88%**	221,117	901,696
FY2021	1,619,344	10,636,307	**104%**	161,934	1,063,631
Total	**10,636,307**	**10,636,307**	**104%**	**1,063,631**	**1,063,631**

4.1.3. Renewable Energy

Given the limited space and raw fuels available within the District, most of the electricity produced within the city's borders is generated from solar photovoltaic (PV) energy. The PSC's Renewable Energy Portfolio Standards compliance report for 2021 highlighted that 154.7 megawatts (MW) of local solar PV had been installed accounting for 10,013 solar energy systems[22]. Favorable solar renewable energy credit (SREC) pricing in the District has created financial viability for rooftop solar that might otherwise have prohibitive costs associated with considerations like mounting and ballasting.

[20] President Biden's Bipartisan Infrastructure Law. The White House. https://www.whitehouse.gov/bipartisan-infrastructure-law/
[21] Inflation Reduction Act of 2022. IRS. https://www.irs.gov/inflation-reduction-act-of-2022
[22] Public Service Commission. Renewable Energy Portfolio Standards A Report for Compliance year 2021. 2022. https://dcpsc.org/getattachment/Orders-and-Regulations/PSC-Reports-to-the-DC-Council/Renewable-Energy-Portfolio-Standard/2022-DCPSC-RPS-Report-FINAL-(1).pdf.aspx?lang=en-US

Between FY17-FY21, the DCSEU provided financial incentives for 17,558 kilowatt (kW) of renewable generation capacity representing 404% of the minimum five-year cumulative benchmark and 351% of the maximum benchmark. Table 5 shows the achievement of the 5-year solar benchmark against the performance benchmarks.

Table 5: Renewable Energy Capacity Performance Benchmark*[23]

Performance Benchmark	Cumulative Achievement	Minimum Target	Maximum Target	Percent of Minimum Target	Percent of Maximum Target
Increase Electric Generation Capacity (kW)	17,558 kW	4,340 kW	5,000 kW	404%	351%

Table 6 shows the progress over five years.

Table 6: Solar Capacity Progress over 5 years

Year	Verified Solar Capacity	Cumulative	Percent of 5-year target
FY17	2,244	2,244	**45%**
FY18	1,836	4,080	**82%**
FY19	7,129	11,209	**224%**
FY20	1,352	12,561	**251%**
FY21	4,997	17,558	**351%**
Total	**17,558**	**17,558**	**351%**

In addition to a performance benchmark for renewable energy generation, the DCSEU also implements the SFA program (SFA installations are not included in the tables above and are not included in the core DCSEU contract). Between FY19-FY21 the DCSEU installed 21,827 kW via SFA with 510 kW installed on single family homes in FY21.

4.1.4.Emissions Impact

FY21 electricity and gas savings, as well as renewable energy savings, yield a total avoided emissions of 37,292 metric tons Carbon Dioxide Equivalent (tCO_2e) based on the most recent (2019) average emission rates, or 0.5% of the total citywide 2019 GHG emissions from the District of 7,172,238 metric tons CO_2e.

While using average annual emissions rates for the regional grid is useful for comparing to the citywide GHG footprint, the more useful metric for actual GHG benefit of efficiency programs is the *marginal*

[23]NMR Group, Inc. DCSEU FY2021 Performance Benchmarks Report. August 11, 2022. https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/DCSEU%20FY2021%20Performance%20Benchmarks%20Report%20FINAL%2008.11.2022.pdf
*Table only includes numbers for commercial

emissions rate, which accounts for the emissions rate of the grid at the time the savings occurred.[24] Using marginal emissions rates, in FY21, DCSEU programs avoided 63,652 metric tons CO_2e (due to differing methodologies, marginal savings cannot be compared to citywide total annual GHG emissions).

Table 7 shows the cumulative progress over the five-year period—note that while annual emissions savings do appear to be increasing, the citywide GHG footprint is also going down due in part to the electricity grid getting cleaner—so the percent savings does not decline as much as the totals.

Table 7: Avoided GHG Emissions over 5 years

Year	Avoided GHG emissions at average annual emissions rates (tCO_2e)	Cumulative Avoided GHG emissions at average annual emissions rates (tCO_2e)	Avoided GHG emissions at marginal emissions rates (tCO_2e)	Cumulative Avoided GHG emissions at marginal emissions rates (tCO_2e)	Citywide GHG Emissions (tCO_2e)	Avoided GHG Emissions as percent of citywide GHG emissions
FY2017	40,389	40,389	66,147	66,147	7,630,604 (CY2017)	0.5%
FY2018	55,478	95,867	92,963	159,110	7,709,200 (CY2018)	0.7%
FY2019	63,450	159,317	107,758	266,868	7,170,450 (CY2019)	0.9%
FY2020	44,602	203,919	74,772	341,640	6,296,946 (CY2020)	0.7%
FY2021	37,292	241,211	64,652	406,292	6,296,946 (CY2020)	0.6%
Total	**241,211**	**241,211**	**406,292**	**406,292**		

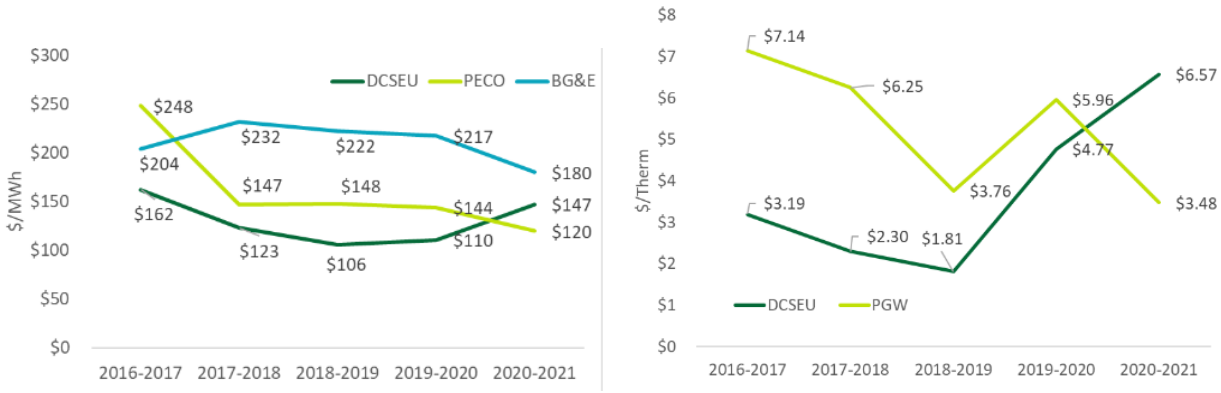
4.1.5. Comparison to other programs

Comparing efficiency programs in different jurisdictions against one another is always difficult—each program and utility are responding to different market conditions and different performance targets while working with different amounts of funding. A common metric is the ratio of spending and savings quantified in the *Cost of Saved Energy*, or $ spent to acquire 1 unit of energy savings. As the Board provided in its report to Council last year, the DCSEU is one of the most cost-effective energy efficiency programs in the nation on this metric.

The evaluator, NMR, studied this issue in their FY21 report, focusing on comparing two programs with a similar climate. The Board is aware that it is difficult to compare utility-executed programs across various

[24] Average GHG emissions rates represent all emissions that occurred within an electricity grid region over a year, divided by the total electricity generation in that region over that year, and are used when calculating a region's "carbon footprint" for a GHG Inventory. (The electricity grid region used for DC emissions calculations, RFCe, encompasses most of Maryland, Pennsylvania, Delaware, and New Jersey.) Marginal Emissions, in contrast, represent the GHG emissions that would have occurred without a given action that changed the electricity load. Marginal GHG emissions rates are the estimated emissions per MWh of electricity that would be emitted by fossil fuel-burning power plants to meet additional electricity demand at a given location and point in time. However, thanks to additional electricity use reductions and/or renewable energy generation, these additional electricity load resources were not needed, and the associated marginal emissions did not occur. As marginal emissions savings represent a counterfactual, they cannot be directly compared to the District's GHG inventory. However, they are a more appropriate representation of the real-world impact of DCSEU programs in combating climate change by reducing the need for GHG emissions. For more, see https://rmi.org/combating-climate-change-measuring-carbon-emissions-correctly/

jurisdictions, as there are multiple variables that impede the ability to make a robust comparison. For electricity, NMR compared DCSEU against PECO Energy in Pennsylvania and Baltimore Gas and Electric (BG&E) in Maryland. As shown in the figures below, the DCSEU's cost of saved energy for electricity in FY21 remained lower than BG&E but slightly exceeded PECO. For gas, NMR compared DCSEU to Philadelphia Gas Works (PGW) - DCSEU's cost of saved energy for gas have risen dramatically over the last few years due in part to the higher cost of running the expanded low-income gas savings program on behalf of Washington Gas' Income Qualified Gas Efficiency Fund. Typically, low-income programs are 2-4x as expensive as market-rate programs due to the utility program paying a larger share of the total costs.



Using the statewide data published by the American Council for an Energy-Efficiency Economy (ACEEE) in their *State Energy efficiency Scorecard 2021 Progress Report*[25] , calculating the cost of saved energy for every state, the DCSEU ranks 5th nationwide for cost of electricity savings, and 18th for cost of gas savings.

The ACEEE report provides to better understanding of how the total savings achieved by the DCSEU compare to its peers. As shown in the red oval below, the District ranks relatively highly for overall savings once accounting for the relatively low amount of money invested in energy efficiency.

[25] Breg, W., E. Cooper, M DiMascio. 2022. *State Energy efficiency Scorecard 2021 Progress Report. American Council for an Energy Efficient Economy*, Washington, DC. https://www.aceee.org/press-release/2022/02/scorecard-update-electrification-revs-states-advance-climate-action

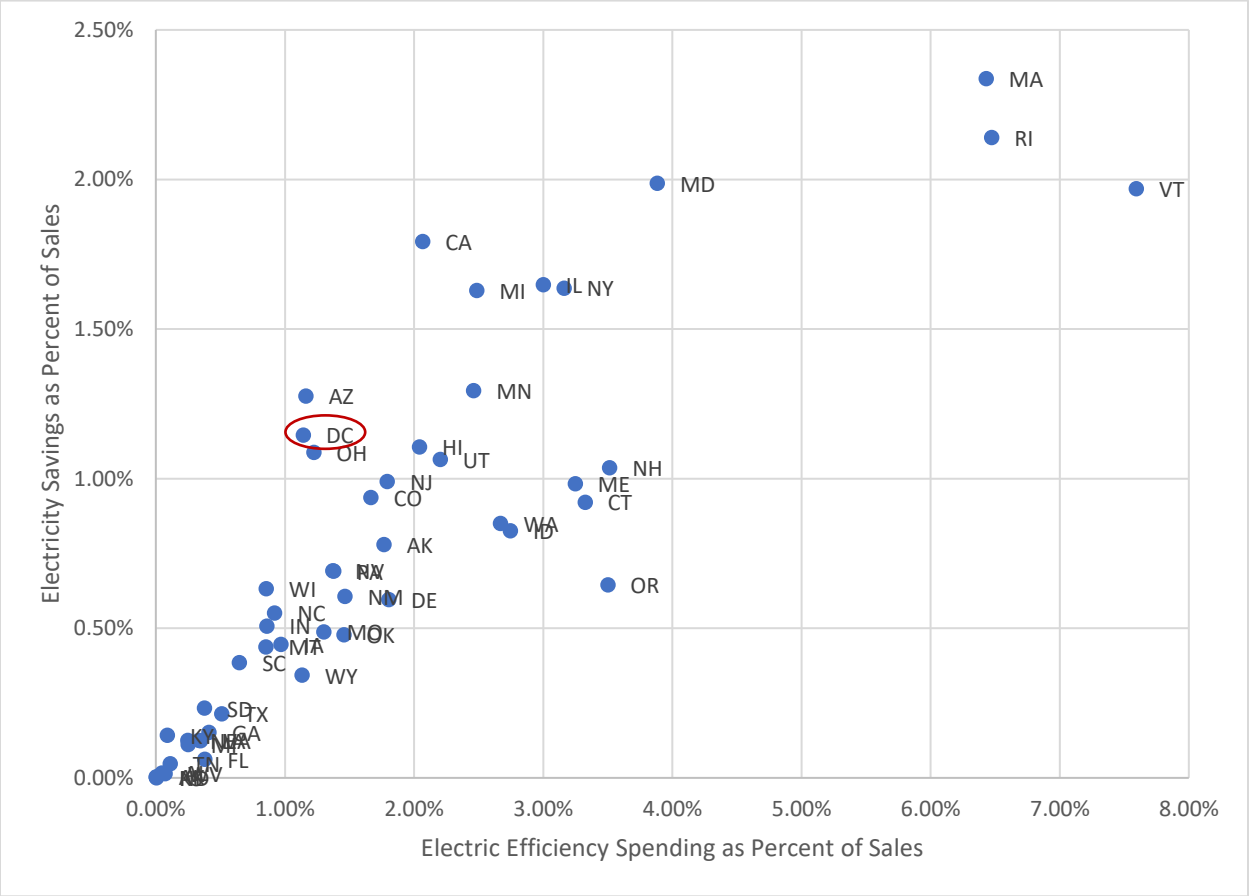


Figure 2: Electric Efficiency Program Spending and Savings by State

The ACEEE report ranked the District as 8th nationwide among all states for energy efficiency, driven in part by the success of the DCSEU, as well as nation-leading legislation from the Council and DOEE's programs. California, Massachusetts, Vermont, Rhode Island, and New York State make up the top five states. All five states also see far higher energy savings than DC does, and the other states also spend substantially more on energy efficiency, by a factor of 2x-7x, relative to electricity sale revenue. To some extent, this higher spending reflects the reality that as the "low-hanging fruit" of energy efficiency are plucked, the remaining savings get more expensive. Thus, it is not surprising that DCSEU's cost of saved energy is beginning to climb. However, to really achieve the deep energy savings that are commensurate with the District's aggressive climate goals, the District will need to see far greater investment in energy efficiency.

Table 8: Top 10 ACEEE States - Efficiency savings and spending

State	ACEEE Scorecard Rank	Electricity Savings as % of sales	Electric Efficiency Spendings as % of sales	Gas Savings as % of sales	Gas Efficiency Spending Rank
California	1	1.79%	2.1%	1.9%	12
Massachusetts	2	2.34%	6.4%	0.8%	31
Vermont	3	1.97%	7.6%	0.3%	7
Rhode Island	4	2.14%	6.5%	0.7%	29
New York	5	1.64%	3.2%	0.3%	20
Maryland	6	1.99%	3.9%	0.3%	4
Connecticut	7	0.92%	3.3%	0.3%	30
DC	**8**	**1.15%**	**1.1%**	**0.7%**	**18**
Oregon	9	0.64%	3.5%	0.5%	23
Minnesota	9	1.29S%	2.5%	0.9%	10

For this reason, the Board welcomes the additional federal funds the DCSEU has received and indeed, while there are outstanding concerns about coordination and market confusion, the additional resources that Pepco will bring to efficiency spending in DC are welcome as well. (However, once Pepco offers its own EEDR programs, the ACEEE state scorecard will no longer present a clear picture of DCSEU performance specifically, so it will be more important than ever for the Evaluator to provide a rigorous survey on this point.)

4.2. Additional Performance Metrics

4.2.1. Low-Income Expenditures and Savings

The continued effects of the COVID-19 pandemic, combined with high inflation, has only increased the need for low-income residents to minimize their energy bills. In FY21, the DCSEU met all low-income targets, achieving significant savings by increasing the efficiency of low-income properties. The Board commends DCSEU for meeting all targets. In the coming year the Board urges DCSEU to focus on ensuring low-income residents benefit equitably for any new programs while continuing to further improve cost-effectiveness of current low-income programs.

4.2.1.1. DCSEU Performance Benchmarks

The DCSEU benchmarks addressing low-income residents and the DCSEU's performance in achieving those benchmarks are:

- *Spend 20% of SETF funds on low-income housing, shelters, clinics, or other buildings serving low-income residents in the District.* DCSEU reported spending $4,859,366 across seven low-income programs, representing 112% of the target.
- *Achieve a minimum of 23,278 MMBtu savings from low-income programs, with a maximum target of 46,556 MMBtu.* DCSEU achieved 55,146 MMBtu in energy savings from low-income programs, representing 237% of the minimum target and 118% of the maximum target. The Retail Lighting Food Bank and Low-income Multifamily Comprehensive Program achieved the greatest share of the savings. With respect to the Multifamily Comprehensive Program, lighting and heat pumps accounted for nearly two-thirds of the program-level savings.

The DCSEU employed seven programs to achieve low-income property savings:

(1) income-qualified gas efficiency fund;

(2) income qualified efficiency fund;

(3) low-income multifamily implementation contraction direct install

(4) low-income multi-family comprehensive;

(5) low-income prescriptive rebate;

(6) retail lighting food bank;

(7) low-income home energy conservation kit.

4.2.1.2. Community Impact

FY21 was the first year that the DCSEU achieved all benchmark targets, including the maximum target for low-income electric and gas savings. The Board commends DCSEU for meeting these targets and urges DCSEU to continue to refine how best to maximize low-income savings. The Board also urges the DCSEU to seek a better understanding of customer satisfaction to learn how to enhance the customer experience. FY23 will bring opportunities and challenges for low-income focused programs as federal funding for energy efficiency, electrification, and clean energy become available and as the DCSEU begins to implement contract changes toward increasing GHG reduction-focused measures. Given the importance of meeting the District's climate change goals, and the potentially high cost, the DCSEU should advance equitable implementation of climate change solutions. The Board urges DCSEU to focus on continuing to achieve all low-income benchmarks while also ensuring that low-income households can maximize the benefits of new federally funded opportunities and local clean energy programs.

4.2.2. Green Jobs

The DCSEU is required to fund green jobs in the District during each year of the contract. The contract requires that the DCSEU fund a minimum of 66 full-time equivalent (FTE) jobs each year. The maximum annual target is 88 jobs. To calculate the number of FTE jobs funded, the contract specifies the following criteria:

- One FTE green job equals 1,950 hours worked by DCSEU staff and subcontractors.
- One FTE green job equals $200,000 worth of DCSEU incentives provided to customers or manufacturers.
- Only direct jobs are to be considered. Indirect jobs and induced jobs are not counted.

As shown in Table 9, from the NMR Report, the DCSEU achieved their annual FY21 green jobs benchmark. NMR calculated that the DCSEU funded 88.3 jobs, representing 134% of the 66 jobs minimum target and 100% of the 88 jobs maximum target.

Table 9: FY21 Green Jobs Benchmark Performance

Measurement	Minimum Target	Maximum Target	Evaluated Number	Percent of Minimum Target	Percent of Maximum Target
Number of FTE jobs funded by the DCSEU	66	88	88.3	134%	100%

4.2.3. Financial Leveraging

The DCSEU was required to leverage between $2.5 million (minimum benchmark) and $5 million (maximum benchmark) between FY17 and FY21. The DCSEU exceeded the maximum benchmark by 114%, leveraging $5,703,822 over the five-year contract period.

Table 10: Cumulative Progress on Leveraged Funds

Year	Annual Leveraged Funds	Cumulative Leveraged Funds	Percent of Maximum Benchmark
FY17	$439,111	$439,111	9%
FY18	$268,881	$707,992	14%
FY19	$317,131	$1,025,123	21%
FY20	$2,019,762	$3,044,885	61%
FY21	$2,658,937	$5,703,822	114%
Total	**$5,703,822**	**$5,703,822**	**114%**

In FY21, the DCSEU received $2,658,937, 97% from Washington Gas to run a Low-Income Multifamily Gas Program, and 3% from the PJM Forward Capacity Market.

4.3. Tracking Goals

4.3.1. Largest Users

The COVID-19 pandemic created a shift in how many large energy users are still operating in the region operate. The drastic decrease in occupancy among the District's commercial corridor coupled with the closing of many small to medium size businesses has placed addition fiscal pressures on property owners and managers. This decrease in income coupled with increased requirements for energy to operate new systems to clean and sanitize property and while adjusting to inflationary pressures has caused many large energy users to (a) reevaluate how they use energy and (b) find ways to cut cost long term. [26]

Table 11: Evaluated Large Energy User Trends

Measurement	FY2021	FY2020	FY2019	FY2018	FY2017
Number of large energy users with completed projects	169	165	89	127	104

As seen in Table 11, the number of large energy user projects drastically increased from FY19 to FY20 and continued to grow in FY21. This trend is expected to continue as the government is encouraging the growth of office to condo conversions of many large commercial properties in the District. Additionally, the recently passed Clean Energy DC Building Code Amendment Act[27] which will escalate the District's clean energy goals by making changes to the building code. This includes proposals before the Construction Codes Coordinating Board (CCCB) which would prohibit the use of fossil fuels for the generation of energy in most new construction and substantial remodeling projects.

4.3.2. Peak Demand

DCSEU programs that reduce electricity consumption also help reduce the District's demand for electricity during "peak" usage times and thus help to reduce GHG emissions. Peak demand usage occurs during the summer months from June through September, between 2:00 p.m. and 6:00 pm, when electricity demand rises to its annual highest due to needs for cooling. Lowering usage at peak demand times can help reduce the need for additional electric capacity to the system - in generation, transmission, and local distribution - to meet the period of increased demand. In addition, peak demand savings may

[26] The DCSEU defines large energy users as government entities, individuals and/or organizations which own a building with more than 200,000 square feet of gross floor area or a campus/building in a contiguous geographic area that share building systems or at least one comment energy meter without separate metering or sub-metering, such that their energy use cannot be individually tracked. Gross area floor includes infrastructure that contain heated and unheated space that is connected to a qualifying building. Energy-efficiency or renewable energy measures must be installed in a qualified building or in an infrastructure connected to a qualified building in order to qualify as a large energy user project.

[27] Clean Energy DC Building Code Amendment Act of 2022. D.C. Law 24-177. Effective Sept. 21, 2022.

negate the need for dirty "peaker plants" which can be more expensive and produce more toxic pollutants and GHG emissions than regular baseload generation plants.

As outlined in its contract, the DCSEU is required to track the reduction of peak demand growth which the Board refers to as "peak demand savings". This goal does not have a financial performance incentive.

NMR's report shows a steady increase in peak demand savings from DCSEU electricity savings programs, between FY17-FY21, with a large jump in savings in FY18 and FY19. These trends are largely correlated to the electric savings.

Table 12: Summer Peak Demand Savings Totals

Year	Summer Peak Demand Savings Totals (MW)
FY17	12.4
FY18	21.4
FY19	22.4
FY20	15.3
FY21	17.7
Total	**89.2**

As the District increasingly electrifies its heating and transportation, the profile of "peak demand" times will change. The District will need to adopt measures tailored to mitigate any new peak times. Managing electrification and the delivery of electricity strategically and comprehensively to keep demand as "flat" as possible is paramount in controlling both emissions and the cost of electricity. Managing peak demand is done through energy efficiency programs, demand response programs (controlled by utilities), building energy automation, time variant pricing options (controlled by users), pairing local solar with battery storage, and timing when local "distributed" generation (solar, battery power, etc.) is fed into the grid, and learning new ways to manage the grid more efficiently and responsively.

The original legislation that established the DCSEU stipulated a more robust role for the DCSEU in reducing peak demand via a "performance benchmark" subject to financial incentives. This benchmark requirement was reduced to a tracking goal in subsequent legislation and not reinstated in the new FY22-FY26 contract due to data access and multi-agency coordination challenges.

4.3.3. CBE Requirements

In FY21, DCSEU spent a total of $10,268,187 (including Solar for All) with CBEs, exceeding its contractual requirement of $6,463,023, and worked with 99 CBE contractors, distributors, vendors, and retailers through the Sustainable Energy Infrastructure Capacity Building and Pipeline (SEICBP) Program.

4.4. Cost Effectiveness

NMR's evaluation found that the DCSEU programs were once again cost-effective in FY21 under the Societal Cost Test, with a Benefit-to-Cost ratio between 1.84 and 1.94 (depending on analysis scenario). This means that for every $1.00 the District of Columbia Government spent on the DCSEU contract, the District as a whole realized $1.84 to $1.94 of benefits. See the attached NMR Performance Benchmarks Report, section 2.2 for more information.

5. Appendices

5.1.FY22 Board Member Attendance

As outlined in the Board's bylaws:

5.0 ATTENDANCE

5.1 ***Board Member Attendance.*** *Members of the Board are expected to attend the meetings of the Board, except if they are unable to attend because of extenuating circumstances, such as for reasons beyond their control.*

5.2 ***Absences and Expiration of Term.*** *After two absences without extenuating circumstances from Board meetings, the Chair or Vice Chair will engage with the Board member, discuss the absences with the Board member, and inquire whether the Board member would like to continue serving on the Board. If a third absence without extenuating circumstances occurs in the same calendar year, such absence will be considered a "Technical Resignation" from the Board by the Mayor's Office of Talent and Appointments (MOTA). The Chair or Vice Chair will inform MOTA that the Board member is no longer active on the Board, and will request that MOTA send a formal notification to the Board member that his/her term has expired.*

Table 9: Board Member Attendance

Name	Representation	Term End Date	FY22 Special Meetings Attendance Record	FY22 Regular Meetings Attendance Record
Bicky Corman (Chair)	Executive Office of the Mayor Designee	1/2/2023	2/2	12/13
Marshall Duer-Balkind (Vice Chair)	Appointee of the Chair of the Committee on Transportation and the Environment, Councilmember Mary Cheh	7/13/2023	2/2	13/13
Sandra Mattavous-Frye	Office of the People's Counsel	1/2/2023	2/2	13/13
Cary Hinton	Public Service Commission	7/13/2024	1/2	11/13
Donna Cooper	Pepco	7/13/2024	2/2	12/13
Eric Jones	Building Management Industry	7/13/2023	0/2	12/13
Nina Dodge	Environmental Group	7/13/2024	2/2	13/13
Jamal Lewis	Low-Income Community	7/13/2024	2/2	9/11
Mishal Thadani	Economic Development	7/13/2024	1/1	7/11
Sasha Srivastava	Renewable Energy	7/13/2024	2/2	11/11
Vacant	Building Construction Industry	N/A	N/A	N/A
Vacant	Appointee of the City Council Chair, Phil Mendelson	N/A	N/A	N/A
Vacant	Washington Gas	N/A	N/A	N/A

5.2.FY22 DCSEU Outreach Events Highlights

October 2: The DCSEU exhibited alongside DOEE and Pepco at the Open Streets DC event on Georgia Avenue in Petworth.

October 6: The DCSEU kicked off its school lighting distribution at Plummer Elementary School on Energy Efficiency Day October 6th, holding a special event and distributing kits directly to students and their families during school dismissal.

October 21: A group of DCSEU staff participated in the Building Innovation Hub's "Success with BEPS" event in October to meet with affordable multifamily building owners and managers whose buildings did not meet the District's Building Energy Performance Standards (BEPS).

October 22: The DCSEU joined the Department on Aging and Community Living Golden Rule Plaza presentation on October 22 to talk to seniors about DCSEU programs and services.

November 3: AHMF 50001 Ready: The DCSEU began recruiting for a joint effort with the U.S. Department of Energy to provide low-income multifamily buildings located in the District of Columbia

with free training and technical support tailored to help reduce operational costs and realize deeper and sustained energy savings. Participation in this six-month program will be limited to a maximum of 15 sites, filled on a first-come, first-served basis.

December 2: The DCSEU partnered with the DC Green Bank, DOEE, and the Deputy Mayor for Operations and Infrastructure on a ribbon cutting event at Fairfax Villages.

December 15: The DCSEU hosted the Affordable Housing Retrofit Accelerator training webinar on December 15, with more than 60 attendees.

December 15: The DCSEU exhibited at the 23rd Annual Senior Holiday Celebration hosted by Mayor Muriel Bowser at the Convention Center. The DCSEU promoted its energy conservation kit, Solar for All, and workforce and training offerings to the attendees. A total of 25 residents requested an income-qualified energy conservation kit at the event.

December 16: The DCSEU Account Management team hosted another University Roundtable that provides local colleges and universities a platform to discuss energy issues and continue our ongoing engagement about Strategic Energy Management (SEM).

January 4: The DCSEU hosted an RFP information session for potential instructors interested in the Train Green SEICBP program.

January 11, 18: The DCSEU presented Train Green SEICBP and contracting opportunities at two DSBLD CBE-focused events, the first for Benchmarking on January 11th, and the second on January 18th covering BEPs.

January 12: A representative from the DCSEU Account Management team presented at Hilton Hotels Regional Engineering meeting to discuss the DCSEU platform and past successes with various projects supported by the DCSEU.

January 26: The DCSEU hosted a virtual interest session for the Train Green SEICBP program. The DCSEU worked with DSLBD and CNHED to promote the session and 31 people attended.

February 2 Green Building Advisory Council Meeting: The DCSEU shared Train Green program information with meeting participants.

February 13 National Association of Regulatory Utility Commissioners (NARUC) Winter Policy Summit: The DCSEU presented on a panel and provided information about the DCSEU's Workforce Development program.

February 16 Department of Small and Local Business Development (DSLBD) Small Business Brief: The DCSEU presented about its current electric leaf blower rebates and how to apply for them along with DOEE, DSLBD, and DCRA. Approximately 20 people attended the meeting.

February 16 American University Sustainability Awareness Basketball Game: The DCSEU provided Energy Conservation Kits, other giveaway items, and information on DCSEU workforce and training opportunities for the annual game.

February 23 Metropolitan Washington Council of Governments (MWCOG) Committee on Air Quality Meeting: The DCSEU was asked to present about the design and implementation of its leaf blower rebates alongside staff from Montgomery County who are implementing electric leaf blower rebates there as well.

February 24 Climate-Forward Efficiency Symposium: The DCSEU attended and shared information about its workforce development and training programs in break out groups.

March 17 DCSEU College and University Roundtable: the DCSEU met with local college and university leaders to update them on DCSEU programs and to address sector interest in the Yale Refrigeration Initiative.

March 23 HAND Environmental Justice Affinity Group: the DCSEU participated in the kickoff meeting for this group to discuss environmental justice work that is ongoing or planned, as well as new opportunities. Approximately 20-25 representatives of various groups participated.

March 25 Washington Metropolitan Chapter Community Associations Institute (WMCCAI) Expo: the DCSEU attended the expo and met with WMCAAI staff to discuss partnership opportunities.

March 29 National Facilities Management and Technology Expo: the DCSEU attended the event and connected with current and prospective Train Green SEICBP instructors and promoted the program's RFQs.

March 31 Making the Grade Washington Business Journal event: the DCSEU co-hosted an event with the Washington Business Journal on the topic of BEPS and the financial and technical resources available to DC property owners and managers. Nearly 300 registered for the virtual event and approximately 150 attended.

April 6 Montgomery County Clean Energy Summit: The DCSEU presented on a panel entitled "Rising to the Clean Energy Workforce Challenge in the Washington Metropolitan Area".

April 21 Earth Day Solar Demonstration at Langley Elementary: The DCSEU shared information about solar energy and its impact in the District, then built solar cookers with approximately 25 students from the school's STEM program.

April 21 Green Building and Climate Leadership in DC and Beyond!: The DCSEU had a representative act as a table moderator at this event held at the French Embassy. The event was designed to help attendees showcase their leadership and commitment to sustainable commercial real estate in and around DC.

April 22 Catholic University Climate Change and the Future of Work: The DCSEU exhibited at the career fair and participated in a panel discussion on the built environment and clean energy actions in DC.

April 22 Hillwood Museum Earth Day Fair: The DCSEU participated in the fair with an exhibit table and was able to connect with about 50 individuals during the event.

April 26 DCSEU Hospitality Roundtable: The DCSEU hosted its first roundtable for the hotel and hospitality market with support from the Institute for Market Transformation (IMT).

April 27 National Clean Energy Workforce (NCEWA) Alliance Community Based, Energy Justice, and Workforce Organizations Convening: The DCSEU participated in a virtual convening to provide insights into opportunities to grow the diverse clean energy workforce. NCEWA plans to use outputs from the meeting to identify the resources and support to promulgate best practices and widely distribute recommendations to address gaps so that funders, policymakers, and other stakeholders can more effectively allocate resources, and organizations can more easily work with employers, training providers, and others on workforce development.

May 11 BISNOW Washington DC State of the Market: Engaged an audience of approximately 200 members of the commercial real estate development and finance community to introduce them to current DCSEU program offerings and Workforce Development Activities.

May 13 Going Solar Seminar Series: As part of DOEE's seminar series the DCSEU presented information about its programs for income-qualified residents, including Single-Family Solar for All, the HVAC Replacement program, and Income-Qualified Energy Conservation Kits.

May 17-19 Better Buildings, Better Plants Summit: A group of DCSEU staff attended the Summit of approximately 750 attendees to make local connections and learn from other energy experts and service providers; Christian Placencia presented on residential efficiency programs best practices. Crystal McDonald presented to a standing-room-only audience of more than 100 on DCSEU workforce development efforts.

May 25 Energy Heroes: Recruiting the Clean Energy Workforce of the Future: The DCSEU's Community Impact team participated in an IREC webinar and working groups in the first of a series of national convenings bringing together practitioners **from the workforce development space to share challenges and opportunities.**

June 2 DCSEU Community Service Day with THEARC DC: The DCSEU team coordinated a community service project with THEARC DC at one of their community garden sites in Ward 6. The team followed up with the organization to determine additional community service and partnership opportunities, including working with their Skyland Workforce Center.

June 8 LEED Convene and Connect: The DCSEU's Community Impact Manager participated in a dialogue with USGBC leadership and approximately 100 local and regional green building experts on the future of LEED.

June 10 DMV Net Zero Energy Coalition Workforce Development event: The DCSEU's Community Impact Manager presented Train Green SEICBP and Workforce Development Program to an audience of 50 training and workforce development providers, local agency staff and contractors.

June 17 Housing Association of Nonprofit Developers (HAND) Annual Housing Summit and Awards: The DCSEU sponsored and exhibited at the event that includes representatives from the multifamily housing community. The team was able to network with potential customers to drive interest and engagement in DCSEU programs that serve market-rate and affordable multifamily properties.

June 27 Rock Creek Ford Solar for All Community Solar Installation Ribbon Cutting: The DCSEU partnered with DC Green Bank, Flywheel Development, and SunStyle on an event to celebrate the completion of the first solar shingle project in Solar for All. The partners were joined by Ward 4 Councilmember Janeese Lewis George.

July 12 DCSEU BEPS and CRE Roundtable: The DCSEU Account Management team, along with IMT, hosted 18 CRE owners and managers to discuss BEPS, best practices, and how the DCSEU can help them make upgrades.

July 14 CNHED Workforce Development Working Group: The DCSEU's Community Impact Manager and Workforce Development Program Manager presented Workforce Development and Train Green programs to a group of approximately 20 WFD professionals in the DC metro area to connect with new potential partners.

July 20 New Buildings Institute (NBI) Zero Energy Programs Working Group: The DCSEU presented updates on Workforce Development and Train Green to approximately 40 energy program staff from local and state agencies, utilities, and non-governmental organizations.

July 21 USGBC National Capital Region "A Midsummer Night's Green" Awards: Multiple DCSEU staff attended this event of the DC metro green building community, which annually brings together more than 300 industry professionals and sustainability advocates from across the region.

July 29 BISNOW DC Affordable Housing Summit: The DCSEU exhibited at the event where more than 250 attendees joined to hear about policies and trends in affordable housing in the District.

August 4 Environmental Stakeholders Meeting: DCSEU staff attended the virtual event to listen to issues surrounding proposed legislation and priorities from the environmental community.

August 16 BISNOW Buzzard Point, Ballpark, and Capitol Riverfront: DCSEU Account Managers attended the event, a regional outlook and presentation about new developments and new opportunities in these areas of the District.

August 22 BISNOW Architecture and Design Summit: A representative from the DCSEU Account Management team attended to event to hear more about upcoming major design projects in DC.

August 24 AHRA Auditor Roundtable: The DCSEU hosted AHRA auditors for another roundtable to discuss program changes, challenges, and next steps.

August 25 DMPED Economic Strategy Roundtables – Reimagining Downtown: The DCSEU attended the event to glean information about how it might approach property owners and managers about projects in an uncertain market.

August 27 Open Streets DC Brookland: Multiple representatives from the DCSEU exhibited at the well-attended event, where the team engaged with many DC residents about residential rebates, Solar for All, HVAC replacement and more.

September 16 Net Zero Energy Home Visit: The DCSEU visited a Net Zero Energy home renovation in progress with contractor AeroBarrier to see the air sealing process in person. The DCSEU determined that the contractor could be a good fit for the Workforce Development program as a mentor.

September 21 Workforce Development Graduation: The DCSEU celebrated the graduation of its spring/summer cohort of externs, with 20 DC residents graduating. The DCSEU welcomed keynote speaker Korey Gray, Vice President of Compliance and Business Development at DC Water, one of the mentor organizations in the program.

September 21 Affordable Housing Retrofit Accelerator (AHRA) Auditor Roundtable: The DCSEU held its next roundtable with auditors working on the AHRA program to go over next steps in the program and answer any questions.

September 22 USGBC-NCR Women in Green: The DCSEU's Gleniss Wade, Workforce Development Program Manager, and former extern Emma West, who now works for WMATA, were featured speakers at the event. DCSEU staff also were able to attend the event.

September 29 BISNOW DC Office Market Insights: The DCSEU sponsored an exhibit table at this well-attended event where commercial real estate representatives were discussing changes and opportunities in the market as it adjusts to new office habits due to COVID.

5.3. Attachment 1 – FC116: DCSEU Board Support Motion for Consideration

FC1167 - 2022 - M - 138

RECEIVED 2022 MAY 11 9:00 AM

ELECTRONIC FILING

November 15, 2021

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

Re: Formal Case No. 1160 -- In the Matter of the Development of Metrics for Electric Company and Gas Company Energy Efficiency and Demand Response Programs Pursuant to Section 201 (B) of the CleanEnergy DC Omnibus Amendment Act of 2018.

Dear Ms. Westbrook-Sedgwick:

The Sustainable Energy Utility Advisory Board (SEUAB, D.C. Official Code § 8–1774.03) submits the enclosed Response in Support of the Department of Energy and Environment's Motion for Reconsideration and Modification of Order No. 21030.

If you have any questions regarding this filing, please do not hesitate to contact the undersigned.

Respectfully submitted,

By: /s/ *Bernice Corman*
BERNICE CORMAN
Chair, Sustainable Energy Utility Advisory Board
1309 P Street NW, Apt 5
Washington, DC 20005
Phone: (202) 213-1672
Email: Bicky.corman@gmail.com

cc: Brian Caldwell
Assistant Attorney General
EEDR Working Group Participants

BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA

IN THE MATTER OF:	**)**	
	)	
The Development of Metrics for	**)**	
Electric Company and Gas Company	**)**	**Formal Case No. 1160**
Energy Efficiency and Demand	**)**	
Response Programs Pursuant to	**)**	
Section 201(b) of the Clean Energy	**)**	
DC Omnibus Amendment Act of 2018	**)**	

RESPONSE OF
DISTRICT OF COLUMBIA SUSTAINABLE ENERGY UTILITY ADVISORY BOARD
IN SUPPORT OF THE DEPARTMENT OF ENERGY AND ENVIRONMENT'S
MOTION FOR RECONSIDERATION AND MODIFICATION OF ORDER NO. 21030

Pursuant to 15 D.C.M.R. § 140.3, the District of Columbia Sustainable Energy Utility Advisory Board (the "DC SEU Advisory Board" or the "Board") respectfully files this response in support of the Department of Energy and Environment's ("DOEE's") November 8, 2021 Motion for Reconsideration and Modification of Order No. 21030 ("DOEE Motion"),[1] in its capacity first, as a member of the Energy Efficiency and Demand Response Working Group ("EEDR WG") convened by the District of Columbia Public Service Commission ("DC PSC") pursuant to Section 201(b) of the CleanEnergy DC Omnibus Amendment Act of 2018 ("CEDC") (adding a new subsection (g)(1) to D.C. Official Code § 8-1774.07); second, in fulfillment of the role assigned to the Board pursuant to the CEDC, Section 201(b) (adding a new subsection (g)(4) to D.C. Official Code § 8-1774.07), to assist DOEE and the DC SEU in determining whether energy efficiency and demand response programs proposed by the utilities are not substantially similar to programs

[1] Pursuant to Section 203 of the Clean and Affordable Energy Act of 2008 ("CAEA," D.C. Official Code § 8-1773.01 *et seq.*), the Board is comprised of members appointed by either the Mayor or the Council to have certain areas of expertise, including in renewable energy, green jobs, low-income, and building construction and management. Board members also include representatives from the District's utilities, Office of People's Counsel, and the DC Public Service Commission.

offered or in development by the DC SEU, and if substantially similar, whether they are supportable; and last, in furtherance of its role under Section 203(a) of CAEA (D.C. Official Code § 8-1774.03(a)), which requires that the Board provide advice, comments and recommendations to the DOEE and the Council regarding the procurement and administration of the SEU contract, advise DOEE on the performance of the DC SEU under the DC SEU contract, and monitor the performance of the DC SEU under the DC SEU contract.

In light of the aforementioned responsibilities, the Board has a strong interest in ensuring the continued vitality of the DC SEU, especially at this critical juncture – when the District's utilities will be augmenting the numbers and types of clean energy services they are also delivering to District ratepayers. The Board believes it is essential that it, the DC SEU, DOEE the DC PSC, OPC, and interested stakeholders, have visibility into the roll-out and implementation of the utilities' programs, and that there be built into the system an ability to course correct, if necessary. The Board agrees with DOEE that bi-annual EEDR WG meetings are too infrequent to allow the parties to be able to ensure that the array of EEDR programs offered by multiple providers are complementary.

As such, and for the reasons stated in DOEE's Motion, in particular, DOEE's concern that the likely overlap between programs proposed by the utilities and those offered by the DC SEU will require regular coordination in order to avoid confusion of ratepayers and to prevent "undercutting" between the DC SEU and PEPCO,[2] the Board strongly supports DOEE's request that the DC PSC reconsider its rejection of the EEDR WG's recommendation that the DC PSC stand up an Evaluation, Measurement and Verification Working Group ("EV&M WG"), or in the

[2] DOEE Motion, pp. 5 – 6.

alternative, that it approve the formation of a Technical Issues Group to meet more frequently than the EEDR WG.

Respectfully submitted,

District of Columbia Sustainable Energy
Utility Advisory Board

Bernice I. Corman
Chair, DC SEU Advisory Board
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CERTIFICATE OF SERVICE

Formal Case No. 1160, *In the Matter of the Development of Metrics for Electric Company and Gas Company Energy Efficiency and Demand Response Programs Pursuant to Section 201(B) of the Clean Energy DC Omnibus Amendment Act of 2018*

I certify that on November 15, 2021 a copy of the District of Columbia Sustainable Energy Utility Advisory Board's Response in Support of the Department of Energy and Environment's November 8, 2021 Motion for Reconsideration and Modification of Order No. 21030 was served on the following parties of record by hand delivery, first class mail, postage prepaid or electronic mail:

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Christopher Lipscombe
General Counsel
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/s/ *Bernice Corman*
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5.4. Attachment 2 – FC 1160 DCSEU Comments

From: Theodore Trabue Jr <ttrabue@dcseu.com>
Sent: Tuesday, November 23, 2021 3:42 PM
To: Lawrence, Taresa (DOEE) <taresa.lawrence@dc.gov>; Epley, David (DOEE) <david.epley@dc.gov>; Loncke, Lancelot (DOEE) <Lancelot.Loncke@dc.gov>; Karim, Hussain (DOEE) <hussain.karim@dc.gov>; Westbrook, Brinda (PSC) <BWestbrook@psc.dc.gov>; Lipscombe, Christopher (PSC) <CLipscombe@psc.dc.gov>; Lincoln-Stewart, Kimberly (PSC) <KStewart@psc.dc.gov>; apatel@opc-dc.gov; Sandra Mattavous-Frye <smfrye@opc-dc.gov>; ffrancis@aoba-metro.org; ndodge432@gmail.com; Caldwell, Brian (OAG) <brian.caldwell@dc.gov>; djamouneau@pepcoholdings.com; bpetruska@maliuna.org; mmurphy@mooneygreen.com; Kristi.singleton@gsa.gov; apizor@nclc.org; jwallington@bapwild.com; Emily.w.medlyn.civ@mail.mil; Meena.gowda@dcwater.com; MAUpadhyaya@venable.com; CThurston-Seignious@washgas.com
Cc: Patti Boyd <pboyd@dcseu.com>; Dylan Voorhees <dvoorhees@veic.org>; Emily Levin <elevin@veic.org>
Subject: FC 1160 DCSEU Comments Nov 23

To the FC 1160 Parties:

By this email, DCSEU hereby notifies parties that we are offering comments in the above captioned matter.

Thank you.

Ted Trabue
Managing Director
DC Sustainable Energy Utility
1 M Street, SE Third Floor
District of Columbia 20003

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F 202-450-1552

November 23, 2021

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. 1160 -- In the Matter of the Development of Metrics for Electric Company and Gas Company Energy Efficiency and Demand Response Programs Pursuant to Section 201 (B) of the CleanEnergy DC Omnibus Amendment Act of 2018

Dear Ms. Westbrook-Sedgwick:

Enclosed please find the District of Columbia Sustainable Energy Utility (DCSEU) comments on Pepco's Application to Approve Three Year EEDR Program in the above referenced proceeding.

Please feel free to contact me if you have any questions regarding this matter.

Sincerely

/s/ Theodore E Trabue, Jr.

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Enclosure:
Cc: All Parties of Record

BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA

IN THE MATTER OF:	**)**	
	)	
The Development of Metrics for	**)**	
Electric Company and Gas Company	**)**	**Formal Case No 1160**
Energy Efficiency and Demand	**)**	
Response Programs Pursuant to	**)**	
Section 201(b) of the Clean Energy	**)**	
DC Omnibus Amendment Act of 2018	**)**	

COMMENTS OF DISTRICT OF COLUMBIA SUSTAINABLE ENERGY UTILITY ON POTOMAC ELECTRIC POWER COMPANY'S APPLICATION FOR APPROVAL OF A THREE-YEAR ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAM ON APRIL 27, 2021

Pursuant formal case number 1160, the District of Columbia Sustainable Energy Utility (DCSEU) respectfully submits the following comments with regard to Potomac Electric Power Company's ("Pepco") proposed Three-Year Energy Efficiency and Demand Response (EEDR) Program.

I. Summary

Since 2020 the DCSEU participated actively in multiple rounds of discussion with Pepco and the EEDR Work Group about a potential EEDR portfolio for Pepco that would not duplicate existing or planned programs from the DCSEU or harm existing energy efficiency markets in the District. As a result of those extended discussions, the DCSEU and Pepco were able to come to agreement around a framework that include a division of programs and market segments, along with a set of principles and general plans for ongoing coordination.

Having reviewed the detailed application proposed by Pepco, we remain broadly satisfied that this framework can benefit the District and meet the necessary statutory requirements, providing certain key parameters are established and the process of coordination and alignment continues in a robust fashion.

In these comments, the DCSEU explains challenges in and importance of aligning the offerings of two separate program administrators and provides specific comments on each of the program areas proposed by Pepco. We divide these into programs for which we have little to no comment or concerns related to duplication or harm to existing markets; programs that require some additional coordination or clarification; and programs with the greatest need for additional effort to avoid duplication.

To address remaining challenges in an efficient manner, we recommend the Commission: explicitly codify in its final order certain parameters of program division; approve an ongoing structure for the more technical aspects of program coordination that is effective without being onerous; and require Pepco (in collaboration with the DCSEU) to report back to the Commission on how a limited number of the more critical remain program alignment issues are to be resolved.

II. Background

The DCSEU is directed to provide energy efficiency programs to the District under Title 8, Chapter 17N (2008) and under contract with the Department of Energy & Environment (DOEE). VEIC, a nonprofit energy services firm, holds a contract with DOEE to act as the DCSEU, leveraging its clean energy experience from multiple jurisdictions to deliver cost-effective savings to residential and commercial customers in the District. The current DCSEU contract with DOEE is a performance-based contract with multiple metrics for reduction in energy consumption (source MMBtu) and greenhouse gas emissions ($MtCO_2e$), increases in renewable energy generating capacity and green-collar jobs, improvement of energy efficiency and renewable energy generating capacity of buildings serving low-income residents, and completion of deep energy retrofits.

Since 2011, the DCSEU has delivered financial incentives, technical assistance, and information to tens of thousands of District residents and businesses, helping them to save over $1.2 Billion dollars in lifetime energy costs and preventing 6.2 Million Tons of CO2e emissions.

Recognizing VEIC's ability to meet performance goals and provide successful energy efficiency programs in the District, in 2021 DOEE extended the DCSEU contract for an additional five years.

The Clean Energy DC Omnibus Amendment Act of 2018 ("Act") allows an electric or gas distribution company to apply to the Commission to offer energy efficiency and demand reduction (EEDR) programs in the District. The Act requires that the proposed EEDR programs must be ones "the company can demonstrate are not substantially similar to programs offered or in development by the DCSEU, unless the DCSEU supports such programs."[1] In order to approve such proposals, the Commission must find (among other criteria) that the proposed programs are "unlikely to harm or diminish existing energy efficiency or demand response markets in which District businesses are operating."[2]

To support Pepco in meeting these standards, the DCSEU has been meeting with Pepco and other stakeholders for more than a year, both inside and outside of the EEDR Working Group established by the Commission.

[1] Clean Energy DC Omnibus Amendment Act of 2018, §8–1774.07(g)(4).
[2] Act, §8–1774.07(g)(6).

III. Avoiding Duplication & Harm to Existing Markets

Layering a substantial new portfolio of energy efficiency and demand response programs alongside or on top of an existing portfolio of successful programs brings both opportunities and risks. The opportunities include leveraging new assets to achieve greater customer savings. The risks include inefficiencies – paying twice for the hard and soft infrastructure needed to support programs, such as databases or contractor networks – or worse, adding confusion into the marketplace that actually *inhibits* uptake of energy efficiency.

Over the last decade, the DCSEU has developed a wide set of tangible and intangible assets that help it deliver energy savings to the District in a cost-effective manner. These assets include a deep track record of District-specific program experience, as well as complex networks of relationships with customers, contractors and equipment suppliers that together constitute a robust energy efficiency market paid for by the District's utility ratepayers (many of whom are also taxpayers). A poorly coordinated layer of new programs could add costs or undermine progress to achieve savings through the DCSEU portfolio.

During discussions between Pepco and the DCSEU about how to achieve new savings without duplication and harm to existing markets, the DCSEU proposed that the most efficient model for augmenting existing programs with additional resources and assets would have been a single administrator model. Under this model, Pepco would contribute additional funding to ramp up existing DCSEU programs and initiatives to reach more customers and obtain deeper energy savings, with a method to appropriately share savings on the back end. The programs would be co-branded between Pepco and the DCSEU, and the organizations would collaborate on marketing and outreach, leveraging both organizations' relationships and brands. This approach could be applied to the entire EEDR portfolio, but it could alternatively be used only for designated programs that make particular sense to offer through a single administrator because they explicitly build on existing DCSEU programs and capabilities. For example, the DCSEU argued that the single administrator model would make sense for midstream incentive programs (due to the potential for administrative streamlining) and for the Commercial Existing Building portfolio (because of concerns about market confusion). The single administrator approach is used in other jurisdictions and in fact was the arrangement the DCSEU used with Washington Gas, which brought together Washington Gas settlement funds and the DCSEU program expertise to save 1.8 million lifetime therms, serving 3,300 low-income residents through $3.3 million in efficiency investments. This partnership met its goals and its budget while delivering 85% of incentives through minority-owned businesses.

The single administrator model was rejected by Pepco because it did not meet their internal criteria for contract administration. However, we continued our discussions in good faith and ultimately reached a workable solution for non-duplication. However, we cannot agree with Pepco's statement in their filing that the proposed approach "best suits the energy efficiency needs of District customers."

The idea of duplication is relatively straightforward. It refers to inefficiency in program delivery that establishes or maintains parallel systems for "substantially similar" energy efficiency programs that could feasibly be combined. Whether we consider the households and businesses of the District as taxpayers or ratepayers, the public does not benefit from needlessly paying twice.

The term "market confusion" applies to a variety of deleterious effects on those involved in a customer's investment in energy efficiency, including the sale, distribution, installation, financing, or permitting of an energy improvement project.[3] The very core of energy efficiency programs is to overcome the inertia market participants have toward new or continued use of inefficient equipment and buildings. Successful efficiency initiatives require market participants to be *aware* of energy efficient options, *motivated* to seek or provide those choices (including because they trust information provided), and *easily able to access* those solutions with minimal disruption, cost and inconvenience. We know all too well that a weak link in any of those creates a barrier to savings, regardless of what is "cost-effective."

While two administrators acting in close concert can conceivably *reduce* these barriers, there are several examples of how an insufficiently coordinated approach could lead to duplication or increase market confusion.

Incentive alignment

When customers or contractors face differing incentives for the same product or service, this can add to market confusion, increasing hassle or hesitancy to participate. Furthermore, the incentives available to customers should be based on market information and program design, and not be dependent on the identity of the program administrator. (Nor should they be based on the financial resources available to the program administrator.)

It is also highly problematic if customers can receive two incentives from different program administrators for the same equipment or project. A sophisticated program portfolio—such as the existing DCSEU portfolio—uses multiple channels to deliver incentives, such as direct rebates for retail purchases and equipment mark-downs at the distributor or supplier level that customers may not even be aware of. A single administrator can manage their programs to track and avoid "double dipping". Having two administrators requires new systems of coordination to avoid double rebates. From an evaluation, measurement and verification perspective, coordination is also required to avoid double *counting* savings.

Contractor engagement

Contractors—and others in the supply chain, such as equipment vendor/distributors/retailers – are critical partners for achieving energy savings. This is especially true in the commercial sector

[3] The Act refers to "harm to existing markets", whereas "market confusion" is a common term used with regard to energy efficiency programming and policy. We take these terms as broadly analogous.

and for HVAC measures, which are areas where Pepco is proposing to add programs alongside existing DCSEU programs. Contractors frequently have no more bandwidth than customers to learn about programs, gather information about newer technology, or perform administrative tasks like filling out forms. Under the new EEDR approach, many contractors (and retailers) will almost certainly have to deal with requirements from two program administrators. Aligning program designs in ways that make it easy for contractors and other market actors to participate is critical to the success of both DCSEU and Pepco programs. This task will take significant effort and flexibility on the part of Pepco and the DCSEU, because each administrator may have preferred approaches based on their program experience in the District or elsewhere.

Marketing

Customer acquisition is a significant challenge and program cost in many areas. Under the proposed agreement, all residential customers will be eligible to be served by different kinds of programs by both administrators. For example, they could improve their HVAC system either through the DCSEU HVAC program, which operates through midstream and retail channels, or Pepco's contractor-drive Home Performance with ENERGY STAR program. The DCSEU obviously conducts marketing to support its programs. Pepco has proposed a very substantial marketing budget. Coordinating these marketing efforts is crucial to ensure customers are not likely to be confused about our programs.

Principles for Coordination and Alignment

In order to avoid harm to markets and ensure that Pepco's new programs are not substantially similar to the DCSEU's programs (as required under the Act), Pepco and the DCSEU agreed on several core principles for ongoing coordination. Those were included in the EEDR Working Group Report. They were summarized in the Commission order on the Report, but we reproduce them here in full:

1) Any agreement on coordination for the delivery of energy efficiency products and services should ultimately benefit all DC customers, especially vulnerable populations for whom energy affordability is critical. New and expanded EEDR initiatives should seek to maximize long-term value for low-income and other vulnerable, hard-to-reach populations and communities.

2) Each entity should have clear and transparent goals that align with the District's energy and climate goals. Pepco, WGL and the DCSEU should ensure that coordination does not place an undue burden on each other's attainment of their goals and obligations to the District.

3) Coordinated program administration should minimize customer and contractor confusion whenever possible. The District should leverage existing customer relationships, energy efficiency programs, and trade ally networks and other existing resources to avoid market confusion, avoid duplication, and take EEDR to scale. EEDR

initiatives should also seek opportunities to scale up existing successful program offerings that may have been constrained by budgets, access to data, or other factors, to bring greater energy savings to more customers.

4) Consultation should be meaningful with a goal of seeking consensus wherever possible. Consultation should be fair and transparent to the parties involved. It is necessary to balance open sharing of program ideas with respecting intellectual property and proprietary business information.

5) Coordination is an ongoing process, not a one-time event, but should not be onerous or inflexible. New and expanded programs should evolve and adapt, and so should structures of coordination. Coordination should not be limited to bilateral cooperation between the DCSEU and Distribution Utilities, if mutually agreed by the Utilities and the DCSEU.

6) Programs where the target customer is in a multi-family dwelling or qualifies as low-income will be handed in a coordinated effort by the Utility, the DCSEU, and other stated DC entities, as mutually agreed, in accordance with paragraph 82 in the Order and other programs will be handled in a coordinated way where the program administrators find advantageous to advance EEDR objectives and these principles.

7) Pepco, WGL and the DCSEU will approach program design in a collaborative manner in order to maximize benefits to District energy users and markets. There is potential—and the law allows, with the DCSEU's consent—for Pepco or WGL to offer programs that enhance the existing DCSEU programs in a given market. Developing programs to complement existing efforts in a single market requires greater cooperation in both design and implementation.

IV. Program-Specific Comments

Our comments on specific programs proposed by Pepco are grounded in the above core principles. We exclusively focus on the issues of non-duplication and supporting existing markets, to ensure that Pepco's EEDR portfolio enhances rather than undermines the District's clean energy efforts.

Broadly speaking, Pepco's Application to Approve Three Year EEDR Program ("Application") reflects the portfolio of programs that Pepco discussed with the DCSEU over many months, leading to an ultimate agreement. For some programs, both parties understood going into the Commission review that more effort would be needed on the details of coordination in order to achieve our mutual principles and compliance with the standards in the Act. In a few cases, the application includes additional details beyond what we previously discussed.

For many programs, the DCSEU has little to no concerns and therefore little to no comment. For those programs with remaining concerns or coordination to be worked out, we believe the best approach is a Commission-sanctioned structure of ongoing coordination that supports

resolution between Pepco, the DCSEU and a few other stakeholders. We also recommend the Commission make some specific orders at this time that will reduce the risks of market confusion and duplication. All our recommendations are summarized in the next section.

Programs with little to no concern

a. Appliance Recycling Program

This program is different than anything the DCSEU offers or plans to offer and therefore we have no concern. Pepco states the appliance recycling program is a "perfect enhancement" to the DCSEU's financial rebates for new, efficient dehumidifiers.[4] We would only note that under our agreement, the DCSEU will no longer offer a rebate for efficient dehumidifiers or other household appliances – that would transition to a Pepco-administered appliance rebate program.

b. Quick Home Energy Check-Up (QHEC) Program
c. Home Performance with ENERGY STAR® (HPwES)

These programs use different program delivery strategies than anything the DCSEU offers or plans to offer and therefore we have no concern. As noted by Pepco, these are examples of programs that will require significant contractor training and engagement, something the DCSEU has done extensively in the District. There may be opportunities for collaboration, or this may be an area where some amount of duplicated effort is unavoidable – unfortunate but not harmful.

It will be critical to determine and agree on a method for avoiding double-counting savings from this program, as several types of measures (e.g., HVAC, lighting) will have incentives available from the DCSEU through other channels. While essential, such a methodology is very feasible and should be addressed through an EM&V or similar technical working group, such as the Technical Issues Group we discuss below in Section V.

d. Energy Engineers Program
e. My Energy Target Program
f. Residential Behavior Based Program
g. Schools and Education Program

We have no comment or concern on any of the above programs.

h. Residential Demand Response Program (Bring Your Own Device)
i. Small Commercial Demand Response Program

These programs use different program delivery strategies than anything the DCSEU offers or plans to offer and therefore we have no concern with adding these programs. However, we note

[4] Pepco Application to Approve Three Year EEDR Program. April 27, 2021. Commission Formal Case 1160. p. 27.

that customers that enroll in a "Bring Your Own Device" demand response program may be making use of smart thermostats for which the DCSEU offered an incentive. In these cases, the DCSEU would claim the energy savings from installing the thermostat, while Pepco would claim the demand savings from enrolling the thermostat in the demand response program. Pepco should not attribute any non-demand savings (e.g. kilowatt-hours) to any BYOD program and instead those savings should be attributed to whatever program provided the incentive for initial purchase or installation of the device (whether that was Pepco or the DCSEU).

Programs that need some additional coordination and clarification

j. [Residential] New Construction and Major Renovation Program

The DCSEU wishes to clarify that per agreement with Pepco, for residential new construction we will only address major renovations for residential multifamily buildings *greater than 50,000 ft*^{2} (not all multifamily buildings with more than four units) and, as stated in the application, major renovations for existing buildings with more than four units.

It will be critical to determine and agree on a method for avoiding double-counting savings from this program, as several types of measures (e.g., HVAC, lighting) will have incentives available from the DCSEU through other channels. While essential, such a methodology is very feasible and should be addressed through an EM&V or similar technical working group, such as the Technical Issues Group we discuss below in Section V.

k. Low- and Moderate-Income Community Pilots

Pepco states that this pilot would target single- and multi-family households that heat with propane, fuel oil or kerosene and help them transition to heat pumps. For multi-family buildings, Pepco will target buildings that are not in the DCSEU portfolio according to our agreement. For single-family households, there is significant risk of duplication with the DCSEU's midstream residential HVAC program. Pepco and the DCSEU have not yet discussed how this duplication can be avoided.

l. [Commercial] New Construction Program

The program description in the application does not state the "design baseline" for which the program will help customers exceed. Based on Pepco's replies to data requests, it is our expectation that the baseline would be building codes as approved in the District.[5] That should be confirmed by the Commission.[6] Is it generally appropriate for an incentive based new construction program to only provide rebates for energy efficiency in excess of mandatory

[5] Pepco Response to OPC Data Request Number 2. November 17, 2021. Commission Formal Case 1160. Question 19.

[6] When/if new codes or amendments are adopted in the District, the baseline should automatically be adjusted for new construction/major rehabilitation incentive programs. Note commercial codes are currently ASHRAE 90.1 2013 plus DC amendments (which functions more like ASHRAE 90.1 2016) and IECC 2015 plus DC amendments for residential. https://dcra.dc.gov/page/dc-construction-codes

building codes. This clarification is also important because the DCSEU will continue to offer technical support (e.g., to code officials, building owners and design professionals) to increase compliance with existing and future building codes, something we have done for many years. Inclusion by Pepco of any energy savings for performance up to the building code risks double counting with DCSEU's existing programs.

h. Commercial Behavior Based Program

The DCSEU is generally supportive of this program offering by Pepco, but we note that the DCSEU has historically offered – and will continue to offer – somewhat related programs for medium and large commercial customers such as strategic energy management and "pay for performance". With behavior-based programs, these approaches all seek to achieve savings at the meter-level, rather than focusing on individual measures, for which savings are "deemed." By using meter-based measurement, these tools can achieve savings from behavioral change as well as equipment upgrades. While these strategies can complement more traditional equipment-incentive based programs, it is especially important to avoid double counting savings. As the single administrator of both measure-based incentives and a pay for performance program, the DCSEU can relatively easily ensure that it does not count double-count savings from equipment savings. We understand from our agreement with Pepco that this program would not target buildings over 50,000 ft2, which will be served primarily by DCSEU through its commercial custom and prescriptive programs as well as meter-based initiatives in some cases.

Programs with the greatest need for additional effort to avoid duplication

a. Efficient Products Program

Pepco and the DCSEU had several discussions about how to best provide support for energy efficient appliances given the DCSEU's current program offerings and Pepco's interest in offering potentially effective midstream strategies. Significant additional efforts are needed to achieve administrative efficiency and avoid market confusion. Specifically, there are three areas of potential concern: alignment of lighting incentives and marketing; inclusion of heating-related equipment; and division of the market for energy efficiency kits.

First, the agreement between Pepco and the DCSEU includes new midstream and online offerings from Pepco and retention of the DCSEU's downstream/retail incentives for lighting. Overall, the DCSEU supports the application of a midstream model by Pepco – this is a good example of an opportunity to leverage Pepco's size and experience elsewhere (e.g., EmPOWER Maryland). At the same time, it is not helpful or fair to consumers to have very different rebates offered depending on where they buy their lighting products. For that reason, Pepco and the DCSEU have agreed to coordinate incentive levels, but it is not yet clear how easy or difficult that will prove, given Pepco's potentially higher budgets per MWh of savings.

It is also apparent that coordination will be needed with regard to working with retail stores. The DCSEU's lighting incentives are currently available through retail stores. In its application, Pepco describes a strategy of aggressive engagement of retail stores to educate staff and customers about Pepco incentives offered at the midstream level. There is potential for retail stores to become frustrated through uncoordinated efforts. If Pepco limits its retail store engagement to appliances, as the application appears to describe, this will minimize that impact. This should be clarified.

Second, during discussions of programs, Pepco and the DCSEU agreed that appliance rebates would transition from current DCSEU-administration to Pepco-administration. We also agreed that the DCSEU would continue to offer a residential HVAC program and Pepco would not offer such a program. However, we did not get to a measure-level discussion for the appliance program. Based on their application, it appears that Pepco intends to include water heaters (specifically heat pump water heaters) in its "appliance" program. The DCSEU intends to offer heat pump water heaters (HPWH) through continuation of its residential HVAC program and has significant goals associated with this measure. In fact, DOEE has requested that the DCSEU accelerate its HPWH impact. Similarly, it appears that Pepco intends to provide incentives to smart thermostats within its appliance program while the DCSEU will continue to offer smart thermostat incentives through its programs.

These emerging overlaps are the natural result of layering such a large, complex portfolio of new programs on top of an existing portfolio – despite many hours of meetings, the DCSEU and Pepco were not able to identify much less address all potential conflicts during the program design phase. Further, Pepco's EEDR portfolio was developed before the DCSEU's five-year contract goals were finalized. HPWHs and smart thermostats are very significant energy savings measures that are important part of the DCSEU's ability to meet its performance goals for the District. Effective and ongoing coordination of program efforts for these measures will be critical to success.

Third, we have some emerging concerns about the distribution of energy efficiency kits. In our agreement with Pepco, we concluded generally that the DCSEU could continue providing kits to limited income households and Pepco could introduce "market rate" kits. However, in the recent order on the EEDR Work Group report (No 20130), the Commission authorized Pepco to use a broad, census-tract based method for Pepco to qualify geographic areas as "limited income." If Pepco is using this method for its energy efficiency kits program and also providing its kits at no cost to the customer, this makes market coordination more complicated and risks significantly eroding the savings and efficacy of the DCSEU kit program.

While there is meaningful broad agreement about how Pepco could introduce an appliance rebate program, it is clear as more program details emerge that risks remain for duplication and inefficiencies. Our recommendations in section [V] are meant to address these concerns.

b. Small Business Program

Although the DCSEU does not offer a "direct installation" program model, we actively serve small business customers. Under the proposed agreement the DCSEU will continue to serve small businesses located in buildings greater than 50,000 ft^2– through custom, midstream, and prescriptive retail incentives – and Pepco will serve small businesses in smaller buildings through direct installations and prescriptive incentives. This program is therefore one that requires meaningful ongoing coordination and alignment to ensure that small businesses have equitable access to program offerings and incentives, regardless of the size of the building in which they are located. As stated by Pepco, it is particularly important that rebate levels be aligned with those offered by the DCSEU, in order to avoid market confusion and distortion.

c. [Commercial] Midstream Program

The DCSEU intends to continue its robust commercial prescriptive program, and Pepco intends to offer prescriptive incentives as well. (See below.) A midstream program can leverage additional savings for commercial customers. Pepco and the DCSEU made a number of conceptual agreements that are needed for this program area to work well alongside the DCSEU's existing programs and the other aspects of the proposed portfolio. Chief among these is the use of identical incentive levels to prevent market confusion. Pepco stated its intent to align incentives in its application; we would like to stress that we see this as a *requirement*.

Pepco also states that it will direct its commercial offerings to buildings less than 50,000 ft^2, per agreement with the DCSEU.[7] It is unclear how it will do this in practical terms for its midstream program, or how exactly the DCSEU and Pepco are to work together toward this objective.

With the Commission's denial of an Evaluation, Measurement & Verification Working Group, we also do not yet have a forum to make decisions about incentive alignment – and to manage it over time, as incentives should be adjusted periodically based on market response and other conditions.[8]

d. Existing [Commercial] Buildings Program

This program area received most of the attention in dialogue between Pepco and the DCSEU leading to an ultimate agreement and generated a high degree of interest from stakeholders on the DCSEU Advisory Board and Building Energy Performance Standards Task Force. Large non-residential buildings represent one of the DCSEU's strongest program areas in terms of meeting performance benchmarks, and offer significant additional energy and GHG emission saving potential. The DCSEU felt that this area constituted the greatest risk for duplication and harm to existing markets. (In review of the final application, we believe this risk can be mitigated through

[7] Application p. 66.
[8] DC Public Service Commission Order 21030, ¶45.

structured additional coordination and alignment but are now concerned that areas not previously addressed related to midstream and residential water heating are the greater issue.)

Pepco and the DCSEU each proposed different approaches to tackling this large market in a non-duplicative way before settling on the approach outlined in Pepco's application. As mentioned above, the DCSEU proposed a single administrator model, whereby Pepco would augment the DCSEU's existing and well-established program for large non-residential buildings while maintaining a single administrator for maximum efficiency. Pepco, in turn, proposed dividing all large non-residential buildings into those that would be served by Pepco programs and those served by the DCSEU, based on factors such as building type and existing relationships. The former option was rejected by Pepco and the latter was ultimately set aside through consensus (including under advisement by other stakeholders) that it would be too difficult to mitigate market confusion. As described in the application, Pepco and the DCSEU finally determined that a division based on building size made the most sense.

All of the challenges of non-duplication and avoiding market confusion discussed in the previous section present themselves strongly in this program. That includes incentive alignment. Pepco states in its application that prescriptive incentives will be aligned "to the extent possible".[9] (Pepco's proposed incentive strategy providing 50% incentives for retrofit projects and 75% for incremental costs of new equipment are higher than what the DCSEU has offered historically, suggesting we may struggle to reach alignment.) Both administrators agree that each should be able to set custom incentives based on the needs of an individual project.

Another challenge is how each entity will target and communicate with customers or contractors. Building owners will generally know whether their buildings are greater than or less than 50,000 ft^2. Building tenants are less likely to know. Those who own or occupy multiple buildings of different sizes may need to deal with both program administrators. The requirement for customers to identify the appropriate program administrator, and especially the potential requirement to work with both for different buildings, creates additional barriers to participation.

The challenges for engaging with contractors, distributors and retailers that serve commercial buildings are even greater, because many of them will serve buildings across the proposed 50,000 ft^2 threshold.

These additional barriers are not insurmountable, but will require extensive ongoing coordination between Pepco, the DCSEU, and other stakeholders to successfully address.

h. LMI Home Energy Program

The DCSEU's comments, concerns, and recommendations regarding Efficient Products discussed above are largely relevant to LMI Efficient Products as well.

[9] Application, p. 69.

The proposed Assisted HPwES program would offer "added incentives for AC replacement, high efficiency room ACs, and potentially ductless mini splits."[10] This offer would overlap with DCSEU HVAC/decarbonization offerings that target low-income households. There is a large market opportunity, but additional detailed coordination would be needed to avoid market confusion and "double dipping".

Finally, the proposed LMI Home Energy Assessment Program states that "Qualifying communities can receive a Quick Home Energy Check Ups that are scheduled in coordination with each other, serving a larger underserved community efficiently." The intended definition of a "community" is unclear. The agreement between Pepco and the DCSEU assigns multi-family buildings greater than 50,000 ft^2 (including all individual housing units), therefore these households should not be included in Pepco's program.

V. Recommendations to Support Program Coordination & Alignment

The DCSEU has three main recommendations for the Commission to maximize benefits for ratepayers, households and businesses in the District by avoiding duplication and market confusion:

1. Affirm certain specific key program decisions;
2. Direct a more concrete process for ongoing coordination and alignment during the implementation phase; and
3. Require a report back on a limited number of critical areas with the greatest risk of market confusion and/or duplication.

1. Specifically recognize in any order approving Pepco's application the following program divisions between Pepco and the DCSEU:[11]

	Pepco	DCSEU
Residential New Construction and Major Renovation	Energy performance beyond approved building codes for new construction and major renovation of all residential buildings < 4 units	Compliance with all approved building codes; Major renovations of buildings >50,000 ft^2
Commercial New Construction	Energy performance beyond approved building codes in all brand new construction, and in major renovations of buildings <50,000 ft^2	Compliance with all approved building codes; Major renovations of buildings >50,000 ft^2

[10] Application, p. 13.

[11] We recognize that the Commission does not have direct jurisdiction over the SEU and its programs, however the Commission can and should provide direction over Pepco's programs

Demand Response (Smart thermostats/ devices)	Demand savings for all enrolled devices; (all kWh savings from devices purchased/installed with Pepco programs)	(All kWh/term savings from device purchased/installed with DCSEU programs)
Energy Efficient Products	Midstream channel, including retail store engagement for appliances; lighting and smart thermostats only through Pepco's online marketplace; water heating only to the extent coordinated with DCSEU (see below)	Midstream channel, including retail store engagement, for lighting and smart thermostats; (water heating under Residential HVAC)
Residential HVAC	Only serves multi-family buildings <50,000 ft^2	Midstream and retail channels for all HVAC equipment, including water heating, in single-family and multi-family >50,000 ft^2
LMI Home Energy Program	LMI Energy Efficient Products measures to mirror market rate efficient products offering (see above); LMI Home Energy Assessment Program to target housing units in MF buildings <50,000 ft^2	
Commercial Behavioral	Targeting buildings <50,000 ft^2	
Small Business	Small businesses located in buildings <50,000 ft^2	Small businesses located in buildings >50,000 ft^2
Commercial Midstream	Buildings <50,000 ft^2, offering the same prescriptive incentives as the DCSEU	Buildings >50,000 ft^2, offering the same prescriptive incentives as Pepco
Existing Non-Residential Buildings	Buildings <50,000 ft^2 (and not in BEPS 2019 or otherwise having DCSEU projects) with incentives aligned with DCSEU to the maximum extent practical	Buildings >50,000 ft^2 (and others with ongoing projects) with incentives aligned with Pepco to the maximum extent practical

2. **Direct use of Technical Issues Group or equivalent to address issues such as measurement of savings and incentive alignment, particularly in programs for existing commercial buildings and areas where midstream and retail channels operate together.**

Throughout 2020-2021, the EEDR Working Group had multiple discussions about how to coordinate potentially overlapping programs between those offered by the DCSEU and

proposed by Pepco. In addition, the DCSEU and Pepco met directly on many additional occasions, including with DOEE as well. Although, as reflected in the EEDR Working Group Report, the Working Group did not reach consensus on all items, we were pleased that we did reach consensus on some key issues as well as reaching agreement between Pepco and DCSEU on additional principles and plans for program coordination, outlined as Appendix A of the EEDR Working Group Report.[12]

Section VI.C. of Pepco's application outlines the importance of an evaluation work group as a key part of ongoing coordination around technical program design and measurement issues, such as incentive alignment. The Commission's denial of an EM&V Working Group in Order 21230 is puzzling and concerning, given this was a consensus recommendation of the EEDR Working Group due to the substantial risks of duplication and market confusion that will need to be mitigated on an ongoing basis. It appears the Commission deemed such a working group duplicative of semi-annual meetings of the full EEDR Work Group. We strongly disagree, and therefore fully support the motion for reconsideration filed by the Department of Energy and the Environment ("Motion").[13] A large group meeting twice annually would be entirely insufficient to address the multiple complex technical matters needed for program alignment and to avoid market confusion and duplication as briefly explained above.

Likewise, simply directing or expecting the DCSEU and Pepco to resolve all issues through completely unstructured one-on-one meetings is also insufficient. Despite the best intentions, the potential for conflict exists between two program administrators with distinct goals, resources, and expertise. The EEDR Working Group recognized that resolution of certain technical issues would be easiest in a small group with multiple perspectives and expertise (as stated in the consensus core principles, which specify that coordination should "not be limited to bilateral cooperation between the DCSEU and distribution utilities").

As proposed in DOEE's Motion, we request that the Commission direct the use of a Technical Issues Group to help facilitate that ongoing alignment and coordination. The Technical Issues Group would be associated with but meet more frequently than the EEDR Working Group. We request that this group include at least Pepco, Washington Gas (as appropriate), DCSEU, DOEE, OPC, a member of the DCSEU Advisory board, and a member of the Commission staff with relevant technical experience. This is not intended as a governance body, nor is it necessary for the Commission to delegate any formal authority to this group over program implementation or evaluation.

[12] Energy Efficiency and Demand Response (EEDR) Working Group Report, filed April 27, 2021. Formal Case No. 1160.

[13] DC Department of Energy and Environment's Motion For Reconsideration and Modification of Order No. 21030. Formal Case No. 1160. November 8, 2021.

3. **Direct Pepco and DCSEU to report back to the Commission with a plan for non-duplication of lighting and HVAC-related equipment through midstream and retail channels, and additional details of incentive alignment.**

Finally, we request that the Commission require a report back to the Commission, prior to program implementation, on a few critical issues that have not been sufficiently resolved but for which the risks of substantially similar programs and harm to existing markets still exist. Such a directive will help to organize and motivate the parties to resolve issues in a collaborative fashion. It will also provide the Commission with assurance that the programs will meet the statutory requirements.

The report back should include:

- An agreement on how HPWHs and smart thermostats will be treated by both program administrators to avoid duplication, achieve effective market transformation, and efficiently leverage each entity's expertise and other assets;
- Specific methods for avoiding double-counting savings or providing incentives for the same measure through multiple channels, including all midstream programs; and
- Additional detail on process flow for customers that need to be directed to one program administrator or the other (e.g., based on building size).

Thank you for the opportunity to comment on Pepco's Three-Year EEDR Program. We look forward to working with the utilities and other stakeholders to support the achievement of the District's energy efficiency and clean energy goals.

Respectfully Submitted,

District of Columbia Sustainable Energy Utility

/s/ Theodore E Trabue, Jr.

Ted Trabue

DC Bar#: 420348
Managing Director
DC Sustainable Energy Utility
1 M Street, SE Third Floor
Washington, DC 20003

CERTIFICATE OF SERVICE

I, the undersigned counsel, hereby certify that on this 23rd day of November 2021, I caused copies of the foregoing to be hand-delivered, mailed, postage-prepaid, or electronically delivered to the following:

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Kimberly Lincoln-Stewart, Esquire
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Sincerely

/s/ Theodore E Trabue, Jr.

Ted Trabue
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5.5. Attachment 3 – FC1167 Initial Comments

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June 10, 2022

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 -- In the Matter of the Implementation of Electric and Natural Gas Climate Change Proposals, Formal Case No. 1167

Dear Ms. Westbrook-Sedgwick:

Enclosed please find the District of Columbia Sustainable Energy Utility (DCSEU) comments on Pepco's 5- Year Action Plan and Benefit and Costs report mentioned in the above referenced proceeding.

Please feel free to contact me if you have any questions regarding this matter.

Sincerely

/s/ Theodore E Trabue, Jr.

Ted Trabue
DC Bar #420348
Managing Director
DC Sustainable Energy Utility
1 M Street, SE Third Floor
Washington, DC 20003

Enclosure:
Cc: All Parties of Record

BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA

IN THE MATTER OF:	)	
	)	
In the Matter of the Implementation of	)	
Electric and Natural Gas Climate Change	)	
Proposals	)	**Formal Case No 1167**
	)	
	)	

COMMENTS OF DISTRICT OF COLUMBIA SUSTAINABLE ENERGY UTILITY ON PEPCO'S CLIMATE SOLUTIONS 5-YEAR ACTION PLAN AND BENEFITS AND COSTS REPORT

I. Purpose of Comments

The DCSEU appreciates Pepco's development of a climate solution action plan and believes it could make meaningful contributions to achieving the District's climate policies. We recognize that elements of the plan span multiple Public Service Commission ("Commission") dockets that include proposed programs and roles for Pepco, namely this case and Formal Case 1160. The DCSEU has considerable experience with electrification programs and policy. The primary purpose of these comments is to inform the Commission about the DCSEU's own climate initiative programs and to seek clarification of assumptions involving Pepco's benefit and cost assessment submitted in their 5-Year Action Plan: Benefit and Costs report.

II. Benefit and Cost Assumptions

The additional incremental cost of approximately $225 million dollars over five years and associated savings merit careful consideration. While the benefit cost analysis prepared by Brattle for Pepco is very informative, the DCSEU requests that Pepco provide details about the underlying assumptions and inputs used to calculate the costs and savings for the 5-Year Action Program. After reviewing the report, it is unclear how the costs and savings were calculated, specifically for "baseline" conditions which underlie the analysis, including what assumptions were made about existing and planned programs provided by the Department of Energy and Environment (DOEE) or DCSEU as well as policies such as District-wide codes and standards. As the current provider of energy efficiency and greenhouse gas reduction programs, understanding these underlying assumptions can help us—and other stakeholders—identify whether those are consistent with the assumptions and planning inputs we use under direction from DOEE.

III. DCSEU's Programs and Incentives

As part of our contract with DOEE, the DCSEU is mandated to provide programs and services that reduce energy consumption and greenhouse gas emissions from the District's buildings in a cost-effective manner. We accomplish this through multiple initiatives that include electrification programs, incentives, and pilots. These programs are consistent with the District's climate policies and are currently helping the District achieve its climate goals. In December 2021 the DCSEU provided Pepco with a memo in regards to their 5-Year Climate Solutions Plan, highlighting areas of potential overlap with DCSEU programs. The following comments provide the Commission with the same information we provided to Pepco.

Many of the new program areas proposed by Pepco represent very positive opportunities and roles for the electric utility and would complement efforts by the DCSEU and rest of the District to achieve climate goals. That includes the segments titled "Activating the Local Energy Ecosystem" and "Enhancing Infrastructure for Climate Solutions". As such, we do not have preliminary comments on those areas at this time, but we remain available for more detailed dialogue about them as Pepco proceeds with planning.

We appreciate Pepco's recognition that it will take the contributions of many parties to achieve those goals, such as on page 47 of the Plan:

> Achieving these reductions will require coordination and collaboration across the District, including the engagement of many government agencies that have set strong targets and policies. For example, Pepco is proud to have partnered recently with the District government, DOEE, DCSEU and more than 20 other organizations to educate District residents and businesses on ways in which they can reduce their energy use and encouraged them to act through the Reduce Energy Use DC Initiative. (p. 47)

We would like to continue to partner with Pepco and other stakeholders on these types of opportunities.

As Pepco is aware, the DCSEU is now operating under a contractual framework that puts greenhouse gas (GHG) reductions at the forefront, in alignment with the Clean Energy DC Plan. The District (our client) is setting high performance expectations and has issued a broad directive to the DCSEU to explore all GHG emission reduction ideas. As a result, the DCSEU is currently expanding its electrification offerings and incentives. This includes both high-efficiency heat pumps and heat pump water heaters, as well as exploring ways to replace other high GHG emitting technologies such as diesel generators with cleaner solutions; everywhere from The Four Seasons to food trucks.

The DCSEU's expansion into a broader set of GHG reduction and electrification initiatives increases the potential for duplication and overlap with initiatives proposed in Pepco's Climate Solutions Plan. We focus our initial comments on the initiatives within Pepco's proposed "Building Decarbonization" portfolio that are most likely to require careful coordination to clarify roles and avoid market confusion.

<u>Energy Efficiency Program Initiative (EEDR)</u>

The DCSEU has already provided comments on Pepco's proposed EEDR programs as part of the EEDR docket and reserves the right to provide additional comments as needed. We will also continue to coordinate closely with Pepco on the technical aspects of program implementation and Evaluation, Measurement & Verification. As a high-level comment, we strongly suggest referring to this initiative as the Pepco DC Energy Efficiency Program Initiative. Since the DCSEU is also operating energy efficiency programs and initiatives in the District, calling the Pepco program the "DC Energy Efficiency Program Initiative" is misleading.

Appliance Electrification Program

We would like to learn more about Pepco's specific vision for this program. It is difficult to tell if the program targets "market rate" homes of limited income homes or both, but we see that it was specifically linked to two LMI-focused programs in the EEDR portfolio. (Assisted Home Performance and LMI Efficient Products.) It is also unclear if it is focused on single family homes.

DCSEU has a significant mandate, and funding, to electrify space and water heating in limited income homes. We will be offering both a dedicated low-income (LI) HVAC and hot water electrification program and an offering through the Affordable Housing Retrofit Accelerator during the new five-year program period, which started in October 2021. This is an enormous market and DCSEU is already ramping up its efforts.

Distribution System Power-Up Rebate & Rebates for Behind-the-Meter Heavy-Up Program

Supporting customers' electrification readiness is vital and a critical gap that needs to be addressed in the District. The DCSEU strongly supports Pepco's proposals to invest in electrification readiness efforts like power-up and heavy-up. To the extent that electrification readiness can be bundled with HVAC and water heating rebates and other energy efficiency incentives provided by DCSEU, this may represent an important opportunity for partnership and coordination. Additionally, coordination to ensure that heavy-ups are performed in an expeditious and structured manner to align with customer project timelines – as well as the DCSEU's funding cycle timelines – will be crucial to the success of these projects.

Dedicated LMI Electrification (Owner-Occupied) Program

Based on the summary in the Plan, it appears this program would overlap quite substantially with DCSEU's HVAC electrification program, including single-family limited homes.

Dedicated LMI Electrification (Rental Properties) Program

We have similar concerns that this program would overlap significantly with the DCSEU's HVAC electrification program. As Pepco knows from our work to develop an EEDR portfolio that is not substantially similar to DCSEU offerings, the DCSEU has a significant focus on multifamily buildings (especially large buildings), including limited income households. This program could directly overlap with the Affordable Housing Retrofit Accelerator.

Demand Side Management Expansion Program

We appreciate the statement "the Company will aim to expand the program after the initial three-year program cycle in Formal Case No. 1160 to include other residential and commercial applications to diversify load reduction, in consultation and coordination with the DCSEU, DOEE and other stakeholders." Any expansion of EE and DSM programs will require extensive coordination with the DCSEU to ensure that program offerings are not substantially similar and are designed to maximize positive impacts for District customers.

We look forward to receiving additional detail about the specific assumptions that went into the benefit-cost analysis of the climate plan portfolio and look forward to considering specific program plans if and when they become specific proposals to the Commission.

Respectfully Submitted,

District of Columbia Sustainable Energy Utility

/s/ Theodore E Trabue, Jr.

Ted Trabue

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5.6. Attachment 4 – FC 1167 DCSEU Reply Comments

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September 16, 2022

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 -- In the Matter of the Implementation of Electric and Natural Gas Climate Change Proposals, Formal Case No. 1167

Dear Ms. Westbrook-Sedgwick:

Enclosed please find the District of Columbia Sustainable Energy Utility (DCSEU) Reply Comments on Pepco's Climate Solutions Plan Filings.

Please feel free to contact me if you have any questions regarding this matter.

Sincerely,

Brandon Bowles
Interim Managing Director
DC Sustainable Energy Utility
1 M Street, SE Third Floor
Washington, DC 20003

Enclosure:
Cc: All Parties of Record

BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA

IN THE MATTER OF:	)	
	)	
In the Matter of the Implementation of	)	
Electric and Natural Gas Climate Change	)	
Proposals	)	**Formal Case No. 1167**
	)	
	)	

REPLY COMMENTS OF DISTRICT OF COLUMBIA SUSTAINABLE ENERGY UTILITY ON PEPCO'S CLIMATE SOLUTIONS PLAN FILINGS

The District of Columbia Sustainable Energy Utility (DCSEU or SEU) appreciates the opportunity to provide brief reply comments on Pepco's climate filings in this proceeding. As an initial matter, we agree with other commenters that several aspects of Pepco's climate plan would represent important steps toward meeting the District's overall climate and clean energy policies and objectives. We reiterate our belief that the distribution utility can and should play an important role in facilitating the decarbonizing of energy use – both in transportation and, the focus of these comments, the building sector.

At the same time, we note that both the Office of People's Counsel (OPC) and the District of Columbia government (DCG, representing, among others, the Department of Energy & the Environment, DOEE) raised significant and important concerns about Pepco's climate filing. Those concerns relate to the scope and completeness of the filings to date, inadequate emphasis on equity, and duplication with existing efforts. For example:

> "Pepco's Climate Business Plan does not meet all of the requirements in Commission Order No. 20754… Pepco has comprehensively failed to deliver the analysis and implementation plan required by [Order 20754] Paragraph 49. While individual aspects of portions of Pepco's filings could be stretched to support claims that individual components of the requirements have been met, when viewed as a whole, neither the spirit nor letter of this requirement has been met." (DCG comments, p. 4)

> "In short, Pepco's filing does not provide a framework for evaluating whether the 5-Year Action Plan has been optimized or selected as part of consideration of a broader range of potential actions… Given the limited time between now and 2050 to achieve the District's climate commitment to carbon neutrality, and between now and 2032 to reduce District of Columbia-wide emissions by 50 percent from 2006 levels, any climate plan by Pepco that does not take a holistic approach and does not follow the consensus BCA framework will necessarily fall short of what the District needs to achieve its climate commitments." (DCG comments, p. 7)

> "OPC opposes the breadth of Pepco's proposed expansion of its current role by offering programs that are better offered through competition, by third party providers, and/or governmental entities and is concerned about Pepco's failure to articulate how it will enable robust third-party competition." (OPC comments, p. 21)

We agree that more work is required to consider and define Pepco's role in the larger context of the District's decarbonization strategy. The same is true of the DCSEU and we welcome that dialogue and accompanying scenario planning. This is especially true as new federal clean energy funding begins to flow into the District.

The DCG and OPC both expressed significant concerns about overlap with DCSEU programs. To address this concern, more detailed information is needed about how Pepco's proposed programs and the DCSEU's current and planned programs can best contribute to achievement of the District's energy and climate goals. Pepco's proposals should be grounded more transparently in a broader long-term strategy for the District that also accounts for the contributions of other entities like the DCSEU, as well as market actors and third-party providers.

To inform more detailed program proposals, there should be significant additional discussion among the key stakeholders. Based on the extensive work conducted ahead of Pepco's application in Formal Case 1160, we believe there is a positive opportunity for such discussion and coordination. To be most constructive, it would be useful for the Commission to give guidance on how parties should approach the issue, or what principles should be used. To be clear, program-level coordination is not a substitute for the larger climate planning called for by the DCG, but it is critical to avoiding duplication and overlap between new and existing initiatives.

We will not re-state the program areas we identified as potentially the most duplicative or overlapping, or the reasons to avoid market confusion and inefficiency; these are outlined in our initial comments on the Pepco 5-Year Climate Plan submitted on June 10, 2022.[1] We observe that several other parties seemed to be in agreement about those areas and the need to address them further.

DAG and OPC both expressed concerns about the Benefit-Cost Analysis (BCA) test `used by Pepco. We do not have any comment on which cost-effectiveness test is appropriate, but we emphasize that a BCA test is foundational to scenario planning and program design, not a secondary consideration. Agreement on the foundation is critical before anything is built on top of it. Furthermore, if different sets of programs, strategies or portfolios in the District are developed using different BCA tests, it makes meaningful comparison and economic optimization much more difficult.

Finally, in its recent decision approving with modifications Pepco's application for Energy Efficiency and Demand Response (EEDR) programs in Formal Case 1160, the Commission noted that the programs not approved in that docket could be considered in this case.[2] In its recent Motion for Reconsideration in FC 1160, Pepco correctly pointed out that no application for programs has been made in this case. We encourage the Commission to require any program proposals to reflect substantial detail (e.g., as expected in an application) before they are evaluated, regardless of which proceeding they are considered under. We do not take any position on how the Commission should now act in either proceeding with regard to programs

[1] DCSEU's comments on Pepco's 5 Year Action Plan and Benefit and Costs Report.

[2] The Public Service Commission of the District of Columbia in Formal Case No. 1160, Order No. 21417, dated August 11, 2022, grants in part Pepco's Application to Approve Three-Year Energy Efficiency and Demand Response Program.

applied for in FC 1160. However, we do agree with other parties who stated that the non-EEDR programs merely outlined in the climate plan do not contain enough information to be sufficiently evaluated at this time.

Thank you.

Respectfully Submitted,

District of Columbia Sustainable Energy Utility

Brandon Bowles

Interim Managing Director
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5.7. Attachment 5 – DCSEU Comments Filed

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May 10, 2022

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 -- In the Matter of the Implementation of Electric and Natural Gas Climate Change Proposals, Formal Case No. 1167

Dear Ms. Westbrook-Sedgwick:

Enclosed please find the District of Columbia Sustainable Energy Utility (DCSEU) comments on Sierra Club's Electrification Study mentioned in the above referenced proceeding.

Please feel free to contact me if you have any questions regarding this matter.

Sincerely

/s/ Theodore E Trabue, Jr.

Ted Trabue
DC Bar #420348
Managing Director
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Enclosure:

Cc: All Parties of Record

BEFORE THE
PUBLIC SERVICE COMMISSION
OF THE DISTRICT OF COLUMBIA

IN THE MATTER OF:	**)**	
	)	
In the Matter of the Implementation of	**)**	
Electric and Natural Gas Climate Change	**)**	**Formal Case No 1167**
Proposals	**)**	
	)	

COMMENTS OF DISTRICT OF COLUMBIA SUSTAINABLE ENERGY UTILITY ON SIERRA CLUB'S ELECTRIFICATION STUDY FOR THE DISTRICT OF COLUMBIA SUBMITTED MARCH 11, 2022

Pursuant formal case number 1167, the District of Columbia Sustainable Energy Utility (DCSEU) respectfully submits the following comments with regard to Sierra Club's Electrification Study for the District of Columbia ("Study").

I. Purpose of Comments

The DCSEU appreciates the development of an electrification study for the District and believes it should be an important piece of information in achieving the District's climate policies. In addition to our role as the Sustainable Energy Utility in the District, VEIC has considerable experience with electrification programs and policy, for buildings as well as transportation. At the same time, we are not offering an evaluation of the study or comments on its recommendations, with the exception of some narrow points directly related to DCSEU programs. The primary purpose of these comments is to inform the Commission about DCSEU electrification programs – those in operation, being planned, or undergoing changes/expansion.

II. DCSEU Electrification Programs

The DCSEU has three primary efforts underway that involve electrification.

First, in FY 2020, the DCSEU designed and operated a Low-Income Decarbonization Pilot (LIDP), which fully funded, for residents of income-qualified single-family homes, the switch from fossil-fuel-based HVAC, hot water, and stove conversions to electric systems. For the FY 2022-2026 contract period, the DCSEU has been awarded additional funding to annually incorporate best

practices and lessons learned from the LIDP to perform similar electrification work in income-qualified single-family homes in our HVAC Replacement Program. The DCSEU will work with contractors to make the fuel-switching from fossil fuel residential heating and water heating systems to electric air source heat pumps and heat pump water heaters. Residents in these homes will also receive benefits through Solar for All to offset increased electricity use and costs.

Second, to support the market's transformation to heat pump technology, the DCSEU is working to shift its standard rebate offerings for efficient electric HVAC equipment from a downstream (end user/resident) to a midstream (vendor) model. We have been informing our future efforts by strengthening our engagement with distributors and manufacturers to transition to mid-stream rebates so that DCSEU and customers benefit from decreased transition costs. Additionally, the DCSEU understands that the market believes that downstream rebates for heat pumps (when fuel switching) should be increased from that which is presently offered for new (non-fuel switching) heat pumps and possibly be aligned with those offered throughout the Northeast US.

Third, the DCSEU's Retrofit Accelerator program offers technical and financial assistance to qualifying owners and managers of multifamily buildings that do not meet the District's Building Energy Performance Standards (BEPS) at no cost. Participants will receive an ASHRAE Level 2 audit that includes a discussion of possible electrification upgrade options in addition to guidance on direct financial and contractor support for energy efficiency upgrades.

III. DCSEU Performance Metrics

The Study references DCSEU performance benchmarks and argues for the need to align them with the District's electrification goals, e.g. with metrics beyond electricity and natural gas consumption.[1] We believe this reference is out-of-date as it does not appear to reflect DCSEU's current performance benchmarks. Beginning in late 2021, our performance benchmarks were redeveloped to include greenhouse gas emission reductions as the central metric.[2] At the same time, the District directed the SEU to eliminate incentives for efficient natural gas-burning equipment. We believe the current performance benchmarks are generally consistent with the objective of electrification.

IV. Comment on Select Recommendations from the Study

The study notes that the DCSEU currently offers incentives for both heat pumps and qualifying energy efficient central air conditioners (CAC) and recommends that only heat pump incentives

[1] Study, p. 27.
[2] DCSEU 5-Year Contract No. DOEE-2016-C-0002: https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/DCSEU%20Multiyear%20Contract%20-%20Mods%201-14.pdf

be offered.[3] While we appreciate the sentiment behind this recommendation, we respectfully disagree with taking that action at this time. DCSEU absolutely intends to promote heat pumps wherever possible as replacements for CAC. However, in a variety of instances, that is not feasible or desirable by the building owner and our incentives help capture energy efficiency gains that would otherwise be missed. DCSEU's performance targets, while employing a GHG metric, depend on our ability to capture cost-effective electrical energy efficiency gains and not only electrification.

Thank you for the opportunity to comment on Sierra Club's Electrification Study. We look forward to working with the utilities and other stakeholders to support the achievement of the District's energy efficiency and clean energy goals.

Respectfully Submitted,

District of Columbia Sustainable Energy Utility

/s/ Theodore E Trabue, Jr.

Ted Trabue

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Managing Director
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[3] Study, p. 45.

5.8. Attachment 6 – DCSEU FY21 Performance Benchmarks Final Report

DCSEU FY2021 Performance Benchmarks Report

FINAL

August 11, 2022

SUBMITTED TO:
District of Columbia Department of Energy and Environment

SUBMITTED BY:
NMR Group, Inc.
Ecometric Consulting
Demand Side Analytics
Blue Path Labs
Setty and Associates

Table of Contents

Glossary

Term	Definition
Average emissions rate	Average greenhouse gas emissions rate (CO2 equivalent per MWh) among all electricity production.
Avoided costs	System costs avoided due to reductions in energy and capacity requirements.
Cost of saved energy	Cost to acquire first-year energy savings. Expressed in units of $/MWh, $/therm, or $/MMBtu.
Energy savings (MMBtu)	Cumulative energy savings reflecting both electric savings and gas savings.
Evaluated or verified savings	Tracked savings values from DCSEU that have been verified by the NMR team.
First-year savings	Estimated energy savings achieved during the first year after the installation of energy-efficient equipment or other measure.
Free-ridership	The portion of program savings that would have occurred in the absence of the program.
Gross electric savings (MWh)	The electric savings that the customer is expected to receive at the meter.
Gross gas savings (Therms)	Gross gas savings includes both cross-fuel and like-fuel interactive effects. Interactive effects reflect the increase or decrease in energy usage due to the installation of an energy-efficiency measure. A common example is an LED bulb installed in conditioned space that produces less waste heat than an incandescent bulb. This reduces the energy consumption from cooling equipment (a like-fuel interactive effect) but increases consumption from gas-fired heating equipment (a cross-fuel interactive effect).
Impact evaluation	Component of the evaluation that verifies the tracked savings reported by DCSEU.
Lifetime savings	Estimated energy savings achieved over the course of the full lifetime of the installed energy-efficient equipment or other measure.
Marginal emissions rate	Greenhouse gas emissions rate (CO2 per MWh) for the final electric generation unit committed to match supply and demand.
Modified gross electric savings (MWh)	The modified gross generator-level savings are calculated by increasing all gross meter-level electric savings to adjust for line losses. Modified gross savings are used to assess the performance benchmarks.
Modified gross gas savings (Therms)	The modified gross gas savings excludes cross-fuel interactive effects. Modified gross savings are used to assess the performance benchmarks.
Net-to-gross ratio	NTG ratio = 1 – Free-ridership % + Participant Spillover %
Non-energy impacts	Non-energy impacts are the impacts beyond energy savings and energy bill savings, such as water savings or improved thermal comfort, attributable to energy efficiency improvements.
Participant spillover	Participant spillover can manifest in participants who take actions beyond the tracked program savings and without financial assistance from the program.
Peak demand savings	Demand savings that occur during the summer peak demand period of 2:00 p.m. and 6:00 p.m. from June through September.
Realization rate	The realization rate equals the ratio of evaluated savings to tracked savings.
Tracked savings	Savings values reported by DCSEU from their program tracking database.

Term	Definition
Societal Cost Test	The Societal Cost Test calculates the cost-effectiveness of programs including the costs and benefits from the program administrator, program participants, and non-participants.

Key Highlights

This report presents the results of an independent assessment of the performance of the District of Columbia Sustainable Energy Utility (DCSEU) energy programs against established benchmarks for Fiscal Year 2021 (FY2021). In FY2021, the DCSEU achieved both the minimum and maximum targets for all benchmarks (Table 1). As FY2021 was the final year of a five-year contract, the FY2021 results reflect the ultimate achievement of DCSEU under the contract, which is most pertinent for the four benchmarks with cumulative targets.

Table 1: FY2021 Performance Benchmarks Summary

Benchmark Type	Benchmark		Minimum Target	Maximum Target
Annual Cumulative Target	1. Reduce Electricity Consumption		✓	✓
	2. Reduce Natural Gas Consumption		✓	✓
	3. Increase Renewable Energy Generating Capacity		✓	✓
Annual Target	4. Improve Energy-efficiency of Low-income Properties	a. Expenditures	✓	*n/a*
		b. Savings	✓	✓
	5. Increase Green-collar Jobs		✓	✓
Five-year Cumulative Target	6. Leverage External Funds		✓	✓

The costs of first-year energy savings increased by about 12% from FY2017 to FY2021. In addition, the cost of first-year energy savings for the DCSEU in FY2021 was higher than that of nearby PECO Energy and Philadelphia Gas Works but less than Baltimore Gas & Electric. Lastly, cost-effectiveness testing found that the DCSEU portfolio was cost-effective in FY2021 and over the course of the five-year contract period.

Executive Summary

NMR Group, Inc., EcoMetric Consulting, Demand Side Analytics, BluePath Labs, and Setty – collectively referred to as "the NMR team" – were contracted by the District of Columbia Department of Energy and Environment (DOEE) to evaluate the energy-efficiency and renewable energy programs implemented by the District of Columbia Sustainable Energy Utility (DCSEU). This report presents the results of our independent assessment of the DCSEU's Fiscal Year 2021 (FY2021) programs, including performance against established benchmarks. The DCSEU FY2021 programs began on October 1, 2020 and ended on September 30, 2021.

The DCSEU contract has a five-year base period that began in FY2017 and ended in FY2021, with an option to extend for an additional five years. The DCSEU officially began working under this multiyear contract in April 2017. The DCSEU's performance against established benchmark targets is based on all results attained against performance benchmarks under Option Year 6 of Contract No. DDOE-2010-SEU-001 that began in FY2010, combined with results achieved under the FY2017 multiyear contract.

Due to the uncertainty surrounding the COVID-19 pandemic's impact on DC energy usage and savings, the DOEE elected to maintain the contracted FY2021 saving goals for DCSEU. While several DCSEU performance benchmarks are measured by first-year energy savings, a single year's impact is relatively small compared to the lifetime energy savings for equipment that participants may install for many years. Therefore, our evaluation approach for FY2021 estimates energy savings assuming a typical year under normal operating conditions.

This report focuses on the core DCSEU programs funded through the Sustainable Energy Trust Fund.[1] Our evaluation of the FY2021 programs found that DCSEU expended the appropriate amount of effort and rigor on their savings calculations. In general, the documentation provided was sufficient, and the methods and assumptions were suitable. The evaluation team believes the DCSEU calculated energy savings with a reasonable degree of accuracy. For more details on our evaluation methodology and findings for each of the DCSEU residential and commercial programs selected for evaluation in FY2021, please review the *DC Sustainable Energy Utility FY2021 Program Evaluation* report.

In addition, Appendix A provides descriptions for each of the program tracks offered by the DCSEU in FY2021.

[1] Appendix C contains cost-effectiveness results for the Solar For All programs. In addition, Appendix C of the *DC Sustainable Energy Utility FY2021 Program Evaluation* report contains details of the evaluation of the Solar For All programs.

PERFORMANCE BENCHMARK AND TRACKING GOALS ASSESSMENT

The DCSEU FY2017-FY2021 multiyear contract specifies performance benchmarks related to energy savings, renewable energy generation capacity, expenditures, leveraging funds, and job creation that the DCSEU is responsible for achieving, as outlined in Table 2. Three of the benchmarks provide performance incentives associated with meeting or exceeding the minimum performance targets on an annual basis and a cumulative basis. The leveraging external funds benchmark provides an incentive at the end of the five-year contract period in FY2021. Additionally, the low-income and green jobs benchmarks provide incentives for meeting or exceeding targets on an annual basis. Likewise, penalties could be assessed on an annual basis if the DCSEU failed to achieve the minimum targets for the low-income and green jobs benchmarks, while penalties for the electric, gas, renewable energy, and leveraging funds benchmarks could be assessed at the end of the five-year contract period if the DCSEU failed to achieve the cumulative minimum targets.

In FY2021, the DCSEU achieved both the minimum and maximum targets for all benchmarks, including those with annual cumulative targets, annual targets, and cumulative targets (Table 2).

Table 2: FY2021 Performance Benchmarks Summary

Benchmark Type	Benchmark	Verified Results*	Minimum Benchmark		Maximum Benchmark	
			Target*	Achieved	Target*	Achieved
Annual Cumulative Target	1. Reduce Electricity Consumption (MWh)	592,331 *(5.1%)*	461,188 *(4.0%)*	✓	576,485 *(5.0%)*	✓
	2. Reduce Natural Gas Consumption (Therms)	10,636,307 *(3.1%)*	8,525,645 *(2.5%)*	✓	10,230,774 *(3.0%)*	✓
	3. Increase Renewable Energy Generating Capacity (kW)	17,558	4,350	✓	5,000	✓
Annual Target	4. Improve Energy-efficiency of Low-income Properties — a. Expenditures	$4,859,366	$4,320,871	✓	*n/a*	*n/a*
	4. Improve Energy-efficiency of Low-income Properties — b. Savings (MMbtu)	55,146	23,278	✓	46,556	✓
	5. Increase Green-collar Jobs	88.3	66	✓	88	✓
Five-year Cumulative Target	6. Leverage External Funds	$5.7M	$2.5M	✓	$5.0M	✓

* The percentage values in italics equal the ratio of cumulative savings to 2014 weather normalized DC consumption, which forms the basis of the contract savings benchmarks. The factor applied to convert electric savings to energy savings = 3.412 MMBtu/MWh and to convert gas savings to energy savings = 1 MMBtu/10 therms. For example, 592,331 MWh = 2,021,033 MMBtu and 10,636,307 therms = 1,063,361 MMBtu.

Figure 1 illustrates the percentage achievement for each of the benchmarks. The DCSEU exceeded all minimum targets by a moderate to substantial degree – ranging from 112% for low-income expenditures to 404% for renewable energy capacity. The DCSEU exceeded the maximum target for the energy savings benchmarks by a small amount – with achievements of 103% for electric savings and 104% for gas savings. At 100%, DCSEU just met the maximum target for the green jobs benchmark.

Figure 1: FY2021 Achievement of Performance Benchmarks

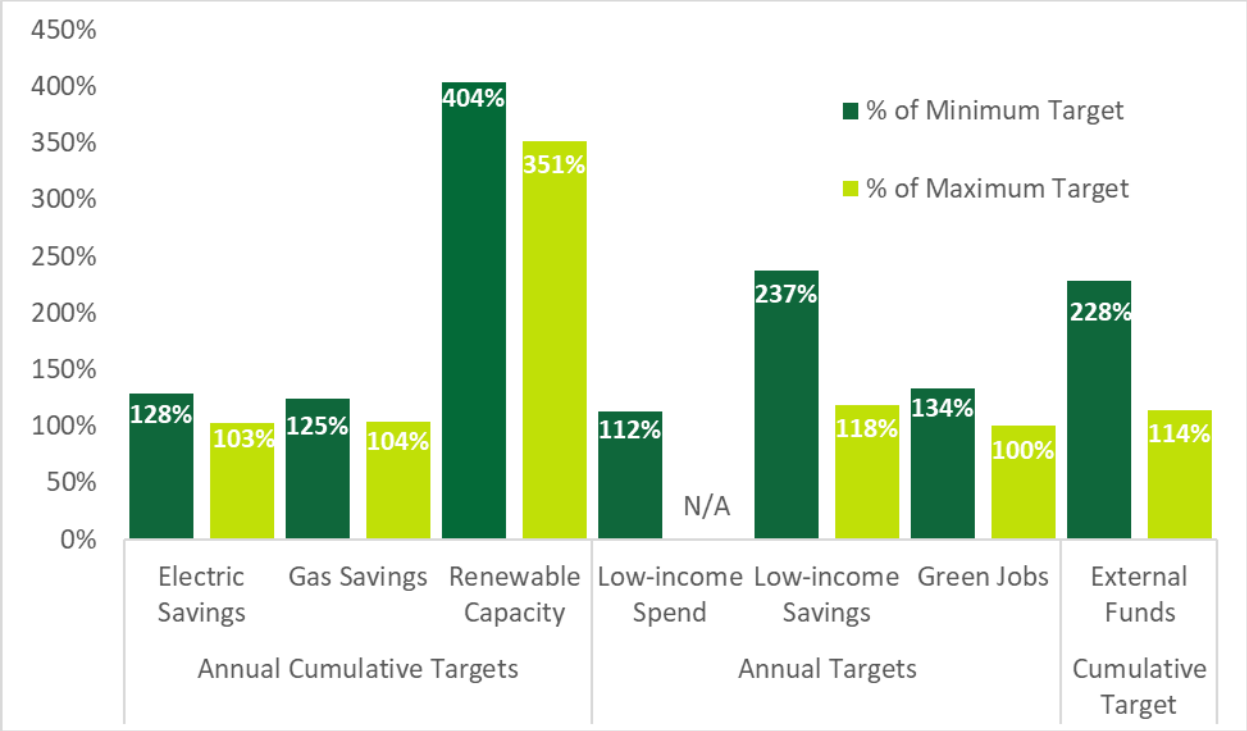

Table 3 displays our assessment of DCSEU's achievement of its tracking goals. The DCSEU achieved 17.7 MW of summer peak demand savings, which represents nearly 1% of District peak demand usage in 2021. In addition, DCSEU completed 169 projects with large energy users in FY2021.

Table 3: FY2021 Tracking Goals and Greenhouse Gas Emission Reductions

Tracking Goal	Evaluated Number
Reduce Growth in Peak Demand	17.7 MW
Reduce Growth in Energy Demand of Largest Energy Users	169 projects
Cumulative Avoided CO2 Emissions, Marginal Emission Rates	406,292 metric tons
Cumulative Avoided CO2 Equivalent Emissions, Average Emissions Rates	241,211 metric tons

The CO2 emissions reductions are calculated using two methodologies – one based on average greenhouse gas (GHG) emissions rates, and one based on marginal emissions rates.[2] Since FY2017, the DCSEU programs are estimated to have saved a combined 241,211 metric tons of annual GHG emissions based on average CO2 equivalent emission rates and 406,292 metric tons based on marginal CO2 emission rates (Table 3). The FY2021 avoided emissions of 37,292 metric tons based on average emission rates represents 0.5% of the estimated District-wide emissions of 7,172,238 metric tons in 2019.

We estimate the DCSEU programs yielded about 517,561 MMBtu in annual energy (electric plus gas) savings in FY2021 — which represents about 0.7% of 2014 weather-normalized DC consumption — and 3,084,661 MMBtu since FY2017. In addition, since FY2017, the DCSEU programs are projected to yield about 6,566,105 MWh (22,403,551 MMBtu) in lifetime electricity savings and 104,223,348 therms (10,422,335 MMBtu) in lifetime natural gas savings over the full life of the measures.

COST-EFFECTIVENESS ASSESSMENT

The NMR team calculated the costs of saved energy and conducted cost-effectiveness testing for the DCSEU's FY2021 programs.

Costs of Saved Energy

To inform future planning of budgets and savings goals, we calculated the DCSEU's cost of acquiring the verified energy savings. The cost of saved energy is a common metric that calculates the cost per unit of energy savings. The cost of FY2021 gross and modified gross first-year electricity savings,[3] excluding the DCSEU's renewables programs, was $43 per million British Thermal units ($43/MMBtu) and $41/MMBtu, respectively (Figure 2). In addition, we calculated that the DCSEU's cost for gross and modified gross electricity savings from renewables programs was $10/MMBtu. For natural gas savings, the DCSEU's cost of gross and modified gross savings[4] was $66/MMBtu and $48/MMBtu, respectively.

While the costs of portfolio-wide gross energy savings decreased from $42/MMBtu in FY2017 to $27/MMBtu in FY2019, the costs have since steadily increased to $47/MMBtu in FY2021. As lower cost energy savings opportunities are exhausted it is typical for the cost of saved energy to increase over time. However, the increase in portfolio-wide costs of energy savings is mostly driven by increased spending on higher cost low-income programs. Low-income spending almost doubled between FY2019 and FY2021 primarily due to the launch of a low-income multifamily gas program for Washington Gas.

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[2] The average emission rates are calculated using a DOEE spreadsheet tool for 2020. The marginal emission rates are based on 2019 PJM estimates. Details are provided in Section 1.2.3.

[3] Modified gross electricity savings exceed gross electricity savings due to adjustments for line losses (see Section 1.1.1 for more detail).

[4] Modified gross natural gas savings exceed gross natural gas savings due to the exclusion of cross-fuel interactive effects (see Section 1.1.2 for more detail).

Figure 2: DCSEU Trends for Costs of First-year Energy Savings

At $147/MWh, the DCSEU's FY2021 cost for gross electricity savings is less than Baltimore Gas & Electric's cost ($180/MWh) but higher than PECO's cost at $120/MWh. At $6.57/therm, the DCSEU's FY2021 cost for gross gas savings was almost double the cost for Philadelphia Gas Works ($3.48/therm). While these comparisons are useful, it is important to understand that these jurisdictions have different markets, savings goals, regulatory requirements, cost-effectiveness tests, program maturity, and delivery systems, which may affect both costs and savings.

The cost to reduce GHG emissions in FY2021 equals $334 per metric ton of CO2 based on the marginal emissions rate.

Cost-effectiveness Testing

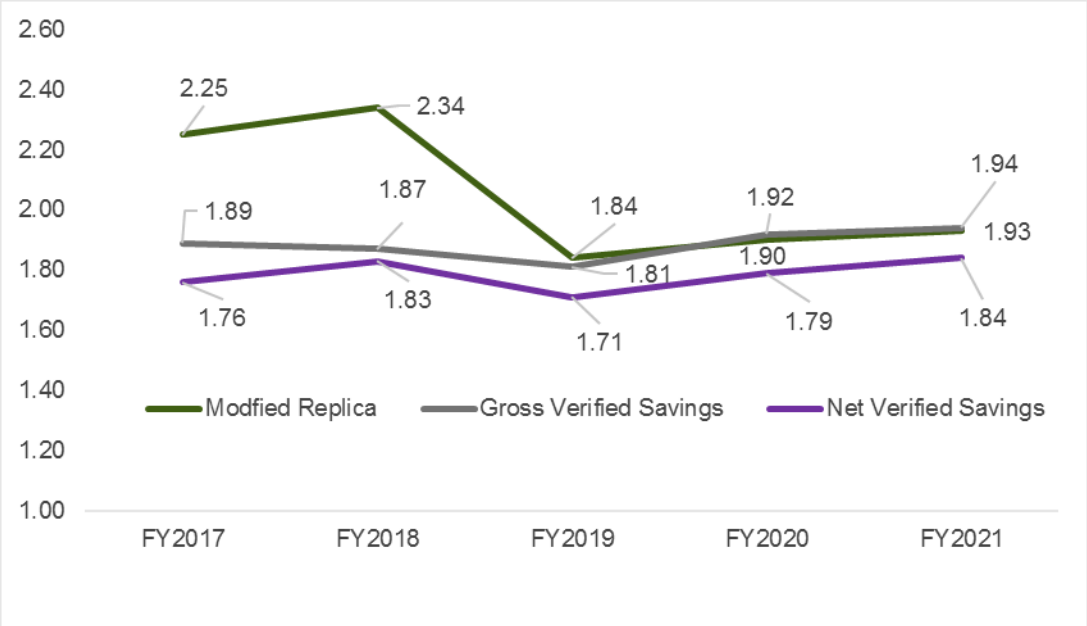
The NMR team conducted a benefit-cost analysis of the DCSEU's FY2021 offerings at the program and portfolio level using a Societal Cost Test (SCT). The SCT examines cost-effectiveness from the perspective of the utility, program participants, and non-participants. The NMR team primarily took model inputs from DCSEU tracking data, which were then adjusted using the results of the FY2021 evaluation. The mechanics of the DCSEU tracking database are well-organized to facilitate benefit cost modeling, and their application was well-documented. Therefore, the NMR team considered three scenarios for the FY2021 benefit-cost analysis:

- **Modified Replica**: This scenario replicated the DCSEU cost-effectiveness calculations to ensure that our model returned comparable results to the DCSEU model. Once we confirmed that our model produced similar results with the same data, we implemented some corrections to inputs and formulas.
- **Gross Verified Savings**: This scenario incorporated the realization rates as determined by the impact evaluation.
- **Net Verified Savings**: This scenario adjusted the tracked savings by both the realization rate and the net-to-gross (NTG) ratio. Incremental measure costs are discounted by the applicable free-ridership rate.

Figure 3 displays the DCSEU portfolio-level cost-effectiveness ratios under each scenario for FY2017 through FY2021. The NMR team found that the DCSEU program portfolio, when taken as a whole, was cost-effective under each of the three scenarios in FY2021. To interpret these

results from a SCT perspective, for every $1.00 spent, the District realized about $1.93 return on its investment in the Modified Replica Scenario, $1.94 return in the Gross Verified Scenario, and $1.84 in the Net Verified Scenario. Since FY2017, the benefit/cost ratios have remained fairly stable, with the exception of the modified replica scenario, which declined in FY2019 after DCSEU incorporated updated avoided cost assumptions.

Figure 3: DCSEU Societal Cost Test Ratio Trends



FY2021 was the fifth and final year of a five-year contract cycle for DCSEU. Table 4 shows the SCT ratio for the five-year cycle as a whole on a gross verified basis. To facilitate aggregation across years, all SCT costs and benefits are expressed in 2017 dollars[5] to align with the beginning of the cycle. The total societal benefits achieved exceed the societal costs to deliver the portfolio by over $376 million and return $1.88 of benefit to society for each $1.00 of investment.

[5] The discount factor was an average of the Real discount factor (3.87%) used by the program over the last 5 years and an additional 2% adder for inflation per the Consumer Price Index (CPI) of All Domestic Goods. The CPI calculator and data can be seen here: https://www.bls.gov/data/inflation_calculator.htm and https://data.bls.gov/timeseries/CUUR0000SA0

Table 4: SCT 5-Year Cycle for Gross Verified Savings Scenario ($2017)

Year	SCT Benefit (thousands)	SCT Cost (thousands)	SCT Net Benefits (thousands)	SCT Ratio
FY2017	$164,103	$86,622	$77,481	1.89
FY2018	$194,752	$104,025	$90,727	1.87
FY2019	$194,785	$107,871	$86,915	1.81
FY2020	$131,011	$68,226	$62,786	1.92
FY2021	$119,989	$61,761	$58,227	1.94
SCT Total	**$804,641**	**$428,505**	**$376,136**	**1.88**

In Section 2.2.3, we offer recommendations to improve the accuracy of future cost-effectiveness testing.

DISCUSSION

Our assessment of DCSEU's achievement of its FY2021 benchmarks found that the DCSEU succeeded in meeting both the minimum and maximum targets for all performance benchmarks. As FY2021 was the final year of a five-year contract, the FY2021 results reflect the ultimate achievement of DCSEU under the contract, which is most pertinent for the four benchmarks with cumulative targets. To provide a broader perspective of DCSEU performance over the course of the five-year contract, Table 5 displays the achievement of benchmarks each year from FY2017 to FY2021.

The DCSEU achieved both the minimum and maximum targets for the electricity savings, gas savings, and renewable energy benchmarks each year. In addition, DCSEU achieved the minimum targets for the annual low-income expenditures, low-income savings, and green jobs each year. However, DCSEU fell short of the maximum targets for the annual low-income savings benchmark for the first four years and for the green jobs benchmark for the first three years. The launch of the Washington Gas Income Qualified Efficiency Gas Fund program in FY2020 contributed to the achievement of the external funds benchmark as well as the low-income savings benchmark in FY2021.

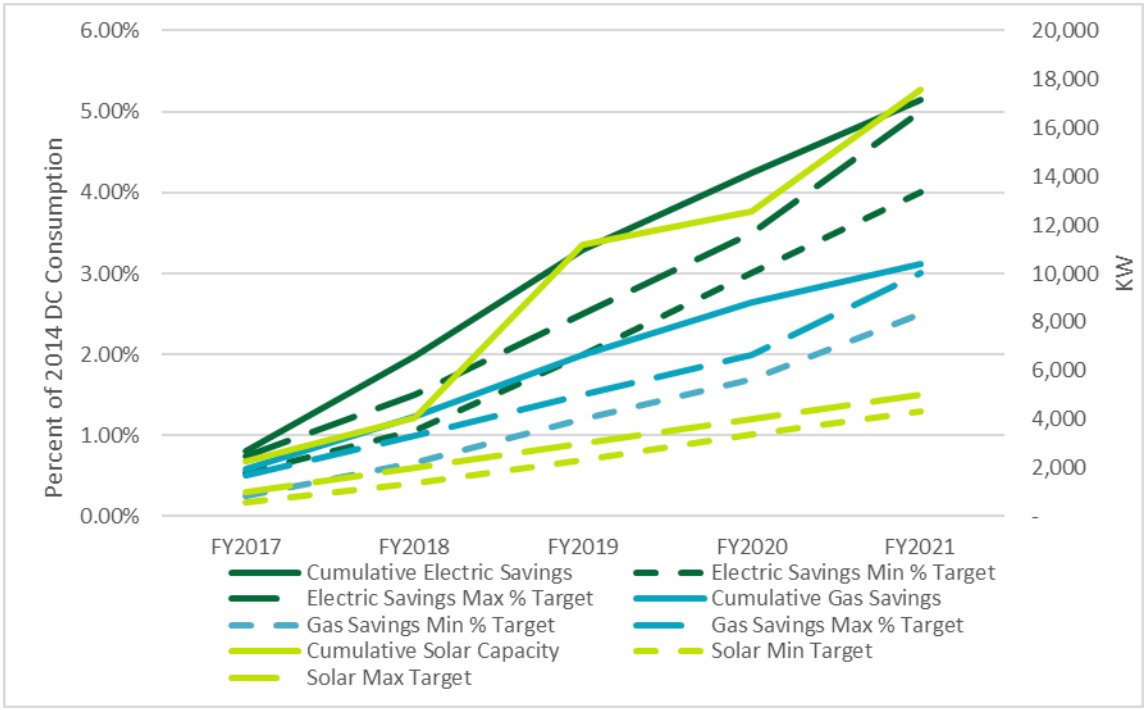
It is important to recognize that the COVID-19 pandemic disrupted programs in FY2020 and, to a lesser extent, in FY2021. In addition, because the full array of benchmarks reflects diverse and sometimes competing objectives, DCSEU must constantly monitor performance to achieve benchmarks. In light of these challenges, DCSEU's achievement of all minimum benchmarks and most maximum benchmarks over the course of five years is notable.

Table 5: Five-Year Performance Benchmarks Summary

Benchmark Type	Benchmark	FY2017		FY2018		FY2019		FY2020		FY2021	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Annual Cumulative Target	1. Electricity Savings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	2. Natural Gas Savings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	3. Renewable Energy Generating Capacity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Annual Target	4a. Low-income Expenditures	✓	*n/a*	✓	*n/a*	✓	*n/a*	✓	*n/a*	✓	*n/a*
	4b. Low-income Savings	✓	X	✓	X	✓	X	✓	X	✓	✓
	5. Green-collar Jobs	✓	X	✓	X	✓	X	✓	✓	✓	✓
Five-year Cumulative Target	6. External Funds	18%	9%	28%	14%	41%	21%	✓	61%	✓	✓

Figure 4 displays the annual progress towards as well as the minimum and maximum targets for the three annual cumulative benchmarks: electricity savings, gas savings and renewable capacity. The electricity savings (dark green lines) and gas savings (blue lines) are shown as a percentage of 2014 weather-normalized DC consumption while renewable capacity (light green lines) is shown in kW units. Overall, DCSEU exceeded the annual electricity and gas savings targets each year by a moderate degree, but exceeded the annual renewable capacity target by a large degree.

Figure 4: DCSEU Cumulative Benchmark Trends



DCSEU's cost of first-year energy savings increased in FY2021 for the second year in a row after declining in previous years. As lower cost energy savings opportunities are exhausted it is typical for the cost of energy savings to increase over time. However, the increase in the portfolio-wide cost of energy savings was mostly driven by increased spending on higher cost low-income programs. In addition, while the cost of first-year energy savings for the DCSEU was lower than one neighboring utility (BG&E), it was higher than two other neighboring utilities (PECO and PGW). In prior years, DCSEU had lower costs than all three utilities.

The cost-effectiveness testing found that the DCSEU portfolio was cost-effective as a whole in FY2021, with benefit-cost ratios in line with previous years. The portfolio's performance over the five-year contract period was cost-effective as well.

In addition, Appendix A provides descriptions for each of the program tracks offered by the DCSEU in FY2021. For detailed recommendations regarding specific DCSEU programs, please see Appendix B.

Section 1 Assessment of Performance Benchmarks and Tracking Goals

In this section, we assess the District of Columbia Sustainable Energy Utility's (DCSEU's) Fiscal Year 2021 (FY2021) achievement of its performance benchmarks and tracking goals. We also provide information regarding cumulative energy savings, lifetime energy savings and reductions in greenhouse gas (GHG) emissions.

1.1 Performance Benchmarks

In this section, we assess the DCSEU's FY2021 achievement of each of the following performance benchmarks:

1. Reduce Electricity Consumption
2. Reduce Natural Gas Consumption
3. Increase Renewable Energy Generating Capacity
4. Improve the Energy-efficiency of Low-income Properties
5. Increase the Number of Green-collar Jobs
6. Leverage External Funds

1.1.1 Reduce Electricity Consumption

The enumerated benchmark for reductions in electricity consumption states that DCSEU shall develop and implement energy-efficiency programs that directly lead to annual reductions of weather-normalized total electricity consumption, measured as a percentage of the total consumption of electricity in the District in 2014. The contract requires that DCSEU achieve a minimum of 461,188 MWh savings across the full five-year contract, which represents 4% of 2014 weather-normalized consumption in the District. The maximum target equals 576,485 MWh savings, which represents 5% of 2014 weather-normalized consumption in the District.

The DCSEU tracks electric savings in two ways: gross meter-level savings and modified gross generator-level savings. The gross meter-level savings reflect the annual electric savings that the customer is expected to receive at the meter. The modified gross generator-level savings are calculated by increasing all gross meter-level electric savings by 4.6% to adjust for line losses. The formula is displayed below.

*Modified gross electric savings = Gross electric savings * 1.04599*

Modified gross generator-level savings are used to assess this performance benchmark.

Table 6 displays the modified gross generator-level electric savings as tracked by DCSEU, our calculated portfolio-level realization rate, and the evaluated savings. The realization rate equals the ratio of evaluated savings to tracked savings (i.e., DCSEU savings recorded in their tracking database). The NMR team estimates that the actual portfolio electric savings equals 104,228 MWh for FY2021, which is 100% of the DCSEU reported tracked electric savings. The cumulative evaluated savings from FY2017 through FY2021 equals 592,331 MWh, which reflects 5.1% of 2014 weather-normalized DC consumption.

Table 6: Modified Gross Electric Savings Verification

Year	Tracked Modified Gross Savings (MWh)	Realization Rate	Evaluated Modified Gross Savings (MWh)	Percent of 2014 Weather Normalized DC Usage
FY2021	104,214	100%	104,228	0.9%
FY2020	106,183	103%	109,368	0.9%
FY2019	155,799	97%	151,321	1.3%
FY2018	135,898	99%	134,728	1.2%
FY2017	93,958	99%	92,686	0.8%
Total	**596,052**	**99%**	**592,331**	**5.1%**

Our gross savings verification of the FY2021 programs found that DCSEU expended the appropriate amount of rigor on their savings calculations. In general, the documentation provided was sufficient, and the methods and assumptions were suitable. The NMR team believes the DCSEU calculated energy savings with a reasonable degree of accuracy.

Table 7 displays our assessment of the DCSEU's achievement of the electric savings benchmark. Our evaluation found that the DCSEU achieved 592,331 MWh in electric savings from FY2017 through FY2021, which represents 128% of the minimum five-year cumulative benchmark and 103% of the maximum benchmark.

Table 7: Reduce Electricity Consumption Benchmark Performance

Modified Gross Annual Electric Savings	Minimum Target (MWh)	Maximum Target (MWh)	Evaluated Savings (MWh)	Percent of Minimum Target	Percent of Maximum Target
Five-year Cumulative Progress	461,188	576,485	592,331	128%	103%

1.1.2 Reduce Natural Gas Consumption

The contract requires that DCSEU achieve a minimum of 8,525,645 therms of natural gas savings across the full five-year contract, representing 2.5% of 2014 weather-normalized consumption in the District. The maximum target equals 10,230,774 therms of natural gas reductions, representing 3.0% of 2014 weather-normalized consumption in the District.

The DCSEU tracks natural gas savings in two ways: gross savings and modified gross savings. The gross savings reflect the estimated annual savings, including both cross-fuel and like-fuel interactive effects. Per the contract, DCSEU calculates modified gross savings by excluding cross-fuel interactive effects. The modified gross savings are used to assess this performance benchmark. Neither the gross nor modified gross gas savings includes upstream gas leakage, which would yield higher savings.

Interactive effects reflect the increase or decrease in energy usage due to the installation of an energy-efficiency measure. A common example is energy-efficient lighting: an LED bulb installed in conditioned space produces less waste heat than an incandescent bulb, which then reduces the energy consumption from cooling equipment but increases consumption from heating equipment. In this case, the cooling savings is a like-fuel interactive effect (the lighting

and cooling equipment both use electricity), while the heating penalty could be a cross-fuel interactive effect (the lighting uses electricity, while the heating equipment could use gas).

The NMR team converted the gas savings, which the DCSEU tracks in MMBtu, to therms by multiplying by a factor of 10.

Table 8 displays the modified gross gas savings as tracked by the DCSEU, the NMR team's calculated portfolio-level realization rate, and the evaluated savings. The realization rate equals the ratio of evaluated savings to tracked savings. The NMR team estimates that the actual portfolio gas savings equals 1,619,344 therms in FY2021, which is 100% of the DCSEU tracked gas savings of 1,622,150 therms. The cumulative five-year figure of 10,636,307 therms represents 3.1% of 2014 weather-normalized consumption in DC.

Table 8: Modified Gross Gas Savings Verification

Year	Tracked Modified Gross Savings (Therms)	Realization Rate	Evaluated Modified Gross Savings (Therms)	Percent of 2014 Weather Normalized DC Usage
FY2021	1,622,150	100%	1,619,344	0.5%
FY2020	2,203,353	100%	2,211,174	0.6%
FY2019	2,718,547	95%	2,569,795	0.8%
FY2018	2,300,391	97%	2,237,961	0.7%
FY2017	2,114,138	95%	1,998,033	0.6%
Total	**10,958,579**	**97%**	**10,636,307**	**3.1%**

Table 9 displays our assessment of the DCSEU's achievement of the gas savings benchmark. Our evaluation found that the DCSEU achieved 10,636,307 therms in gas savings since FY2017, representing 125% of the minimum five-year cumulative benchmark and 104% of the maximum benchmark.

Table 9: Reduce Gas Consumption Benchmark Performance

Modified Gross Annual Gas Savings	Minimum Target (Therms)	Maximum Target (Therms)	Evaluated Savings (Therms)	Percent of Minimum Target	Percent of Maximum Target
Five-year Cumulative Progress	8,525,645	10,230,774	10,636,307	125%	104%

To compare gas savings to electricity savings, we converted the gas savings from therms to MWh.[6] At the equivalent of 311,732 MWh, the cumulative FY2017-FY2021 evaluated gas savings represent about 53% of the comparable electricity savings.

1.1.3 Increase Renewable Energy Generation Capacity

The DCSEU is tasked with increasing the renewable energy generation capacity in the District, primarily through the installation of solar photovoltaic (PV) and solar thermal systems. The

[6] We converted therms to MWh by first dividing by 10 therms per MMBtu then dividing by 3.412 MMBtu per MWh.

contract requires that the DCSEU provide incentives to fund the installation of a minimum of 4,350 kW of renewable energy generating capacity across the five-year year contract period. The maximum target is 5,000 kW.

According to the DCSEU tracking database, solar PV systems were installed at nine sites during FY2021. These installations spanned three programs, as illustrated in Table 10.

Table 10: FY2021 Solar System Summary

Program Name	Track Number	Number of Sites	Tracked Solar Capacity (kW)	Verified Solar Capacity (kW)
Solar PV Market Rate	7101PVMR	5	4,715	4,715
New Construction - Comm Custom	7520NEWC	2	221	221
Low-income Multifamily Comprehensive	7612LICP	2	61	61
Total			**4,997**	**4,997**

For these nine sites, we summed the renewable energy capacity of solar PV systems using the *KWLoad* variable[7] included in the DCSEU tracking database. The NMR team evaluated four FY2021 projects from the solar PV market rate track and found that the tracked generation capacity was accurate. The nine sites are projected to generate a total of 8,909 MWh in annual electric savings.

Table 11 displays the tracked and verified solar generation capacity for FY2017 through FY2021. Overall, a total of 17,558 kW in solar generation capacity has been installed.

Table 11: Renewable Energy Capacity Verification

Year	Tracked Solar Capacity (kW)	Realization Rate	Verified Solar Capacity (kW)
FY2021	4,997	100%	4,997
FY2020	4,200	32%	1,352
FY2019	7,129	100%	7,129
FY2018	1,836	100%	1,836
FY2017	2,244	100%	2,244
Total	**20,406**	**86%**	**17,558**

[7] The *KWLoad* variable reflects the electric generation capacity of solar PV systems in Alternating Current kilowatts.

Table 12 displays our assessment of the DCSEU's achievement of the renewable energy generating capacity benchmark. Our evaluation found that the DCSEU incentivized 17,558 kW of renewable generation capacity since FY2017, representing 404% of the minimum five-year cumulative benchmark and 351% of the maximum benchmark.

Table 12: Renewable Energy Capacity Benchmark Performance

Electric Generation Capacity from Solar PV and Solar Thermal Sources	Minimum Target (kW)	Maximum Target (kW)	Evaluated Capacity (kW)	Percent of Minimum Target	Percent of Maximum Target
Five-year Cumulative Progress	4,350	5,000	17,558	404%	351%

DCSEU also implements the Solar For All programs which install solar PV systems in the District; the Solar For All programs underwent separate supplemental evaluation and cost-effectiveness testing.[8]

1.1.4 Improve the Energy-efficiency and Renewable Energy Generating Capacity at Low-income Properties

Per the DCSEU contract, the low-income benchmark includes two separate metrics that must be met on an annual basis:

1. Spend 20% of the Sustainable Energy Trust Fund (SETF) funds on low-income housing, shelters, clinics, or other buildings serving low-income residents in the District.
2. Achieve 46,556 MMBtu in electricity and natural gas savings from low-income programs.

To verify that tracked low-income program expenditures and savings were accrued to eligible low-income projects, we reviewed the 51 low-income multifamily projects that we sampled for the FY2021 evaluation to ensure that they met the low-income program requirements.

For FY2021, "low-income households" are defined as those with annual incomes equal to or below 80% of the Area Median Income (AMI) or 60% of the State Median Income (SMI). Affordable, low-income housing in the District is defined as one of the following:

1. A single home where the owner or occupant meets the definition of *low-income household*;
2. A multifamily building where at least 66% of the households meet the definition of *low-income household;*
3. Buildings owned by non-profit organizations or the government that meet the definition of low-income households; or
4. Buildings where there are contracts or other legal instruments in place that assure that at least 66% of the housing units will be occupied by low-income households.[9]

[8] Appendix C contains cost-effectiveness results for the Solar For All programs. In addition, Appendix C of the *DC Sustainable Energy Utility FY2021 Program Evaluation* report contains details of the evaluation of the Solar For All programs.

In addition to low-income housing, the DCSEU contract allows low-income programs to target shelters, clinics, or other buildings serving low-income residents in the District. These 51 low-income multifamily projects are comprised of 46 unique sites, and all met at least one of these low-income criteria. Table 13 displays the 46 sites and notes the verification category they met to achieve low-income status.

Table 13: FY2021 Low-income Site Verification

Program Track	Site ID	Project ID	Site Name	Verified (Y/N)	Verification Criteria
Income Qualified Gas Efficiency Fund (4335IGEF)	35865	20158	LeDroit Apartments[10]	Y	Listed as DCHA Public Housing Property
	710	20160	Claridge House Towers10	Y	Listed as DCHA Public Housing Property
	2514	20161	Syphax Gardens[11]	Y	Listed as DCHA Public Housing Property
	31298	20166	Bennington Station Apartments[12]	Y	Participates in DC Housing Choice Voucher Program
	8331	20167	Glendale Plaza Apartments[13]	Y	Participates in DC Housing Choice Voucher Program
	35963	20173	215 Oakwood St SE	Y	All rent values are below HUD Home Rent Limit[14]
	36054	20174	39 Mississippi Ave SE	Y	All rent values are below HUD Home Rent Limit
	35962	20175	1525 28th St SE	Y	All rent values are below HUD Home Rent Limit
	24635	20176	Christ House: Kairos House	Y	All rent values are below HUD Home Rent Limit
	23857	20178	300 62nd St NE	Y	All rent values are below HUD Home Rent Limit
	8369	20180	JW King Senior Center[15]	Y	Listed on HUD as receiving LIHTC
	31865	20181	503 Valley Ave SE	Y	All rent values are below HUD Home Rent Limit
	24186	20184, *20603 (IQEF)*	4180 Livingston Rd SE	Y	All rent values paid by tenants are below HUD Home Rent Limit
	2623	20185	2201 Champlain St NW	Y	All rent values are below HUD Home Rent Limit

[9] "Low-income – Income Qualification FY17."
[10] https://www.dchousing.org/vue/customer/properties_view.aspx
[11] https://www.hrsa.gov/opa/eligibility-and-registration/health-centers/fqhc/index.html
[12] https://www.benningtonstationdc.com/
[13] https://www.glendaleplazadc.com/
[14] https://www.huduser.gov/portal/datasets/HOME-Rent-limits.html
[15] https://resources.hud.gov/#

Program Track	Site ID	Project ID	Site Name	Verified (Y/N)	Verification Criteria
Income Qualified Efficiency Fund (7610IQEF)	25502	19997	Unity Healthcare – Anacostia	Y	Classified as a Federally Qualified Health Center 11,[16]
	24936	20511, *19215 (IQEF)*	Douglass Knolls Apartments[17]	Y	Participates in Federal LIHTC Program
	209	21082	Southern Homes & Gardens	Y	All rent values are below HUD Home Rent Limit
	24195	21468	Marshall Heights Community Development Organization[18]	Y	Listed as a HUD Approved Housing Counseling Agency
	27465	21826	The Gregory Apartments[19]	Y	Listed as affordable housing on Open Data DC
	37268	21827	Naylor Gardens Cooperative Housing	Y	All rent values are below HUD Home Rent Limit
	25504	21828	Unity Healthcare – Upper Cardozo	Y	Classified as a Federally Qualified Health Center
Low-income Multifamily Implementation Contraction Direct Install (7610ICDI)	4763	20966	Marbury Plaza	Y	All rent values are below HUD Home Rent Limit
Low-income Multifamily Comprehensive (7612LICP)	13270	15155	South Capitol Multifamily Building[20]	Y	Listed as affordable housing; funded through HPTF.
	11083	17666	4811 North Capitol St NE19	Y	Listed as affordable housing on Open Data DC
	16028	18013	Petworth Station Apartments[21]	Y	Participates in Federal LIHTC Program
	30748	18231	809 Kennedy St NW19	Y	Listed as affordable housing on Open Data DC
	24230	18232	Capitol Vista Apartments19	Y	Listed as affordable housing on Open Data DC

[16] https://doh.dc.gov/sites/default/files/dc/sites/doh/DC%20FQHC%20Site%20List%202013.pdf

[17] https://affordablehousingonline.com/housing-search/District-Of-Columbia/Washington/Douglas-Knoll-Coop/10026003

[18] https://www.publichousing.com/details/dc_marshall-heights-community-development-organization

[19] https://opendata.dc.gov/datasets/affordable-housing/explore

[20] https://mocrs.dc.gov/release/mayor-bowser-makes-historic-investment-138-million-affordable-housing

[21] https://wcsmith.com/apartments/petworth-station/

Program Track	Site ID	Project ID	Site Name	Verified (Y/N)	Verification Criteria
	9940	18462	Randle Hill Apartments19	Y	Listed as affordable housing on Open Data DC
	31295	18655	The Madison 5616 13th St NW	Y	70% of rent values are below HUD Home Rent Limit
	8302	18918	Delta Towers19	Y	Listed as affordable housing on Open Data DC
	25505	20483	Unity Healthcare - Brentwood	Y	Classified as a Federally Qualified Health Center
	25501	20484	Unity Healthcare – Minnesota Ave	Y	Classified as a Federally Qualified Health Center
	421	20979	Northwest Cooperative Homes[22]	Y	Listed as affordable and subsidized housing by DC Housing Authority
	37233	21555	Livingston Road Senior Apartments19	Y	Listed as affordable housing on Open Data DC
	37305	21710	The Robinson Apartments	Y	Participates in DC Housing Choice Voucher Program[23]
	37304	21711	Mills Place19	Y	Listed as affordable housing on Open Data DC
	207	21915	Greenleaf Gardens Apartments10	Y	Listed as DCHA Public Housing Property
	23898	21917	Horizon House10	Y	Listed as DCHA Public Housing Property
	37460	22042	1550 1st St SW19	Y	Listed as affordable housing on Open Data DC
	1451	22156	1111 Massachusetts Ave NW20	Y	Listed as affordable housing; funded through HPTF.
	37787	22320	128-146 Wayne Place SE	Y	All rent values are below HUD Home Rent Limit
	32027	22954	The Solstice19	Y	Listed as affordable housing on Open Data DC
	7199	23185	Nannie Helen Burroughs10	Y	Listed as DCHA Public Housing Property
	28928	23196, *20165 (IGEF), 20457*	Langston Lane Apartments15	Y	Listed by HUD as low-income, subsidized housing

[22] http://www.dchousing.org/docs/housing_resources.pdf

[23] https://washington.dc.networkofcare.org/mh/services/agency.aspx?pid=DCHousingAuthorityHousingChoiceVoucherPrograms_2_1347_1

Program Track	Site ID	Project ID	Site Name	Verified (Y/N)	Verification Criteria
		(IQEF), 20458 (IQEF)			
	36772	23374	1820 California St Co-op22	Y	Listed as affordable and subsidized housing by DC Housing Authority
	7104	23375	Deanwood Rehabilitation & Wellness Center	Y	All rent values are below HUD Home Rent Limit

Based on our review of the 46 sampled sites, we assume that all program costs and savings allocated to low-income programs were accrued by eligible low-income properties.

Next, we assess the expenditure benchmark, followed by the savings benchmark.

1.1.4.1 Spend 20% of SETF funds at Low-income Housing, Shelters, Clinics, or Other Buildings

The DCSEU contract specifies that the calculation of the low-income spend percentage include portfolio-wide administrative and support costs in the denominator but not the numerator.[24] Therefore, the NMR team applied the following equation:

$$\textit{Low-income spend \%} = \frac{\textit{Low-income program costs}}{\textit{Cumulative program costs} + \textit{Portfolio administrative \& support costs}}$$

Table 14 displays our assessment of DCSEU's achievement of the low-income expenditure benchmark. Based on the total FY2021 portfolio expenditures of $21,604,353, the contract requires that DCSEU spend a minimum of $4,320,871 (20%) on low-income programs. There is no maximum target for low-income expenditures.

DCSEU reported spending $4,859,366 across seven low-income programs, representing 112% of the target.

Table 14: FY2021 Low-income Expenditure Benchmark Performance

Measurement	Minimum Target	Evaluated Number	Percent of Minimum Target
Dollars spent on low-income properties	$4,320,871	$4,859,366	112%

[24] The denominator includes all SEU SETF costs but does not include the costs of DOEE oversight or the NMR team evaluation.

1.1.4.2 Achieve 46,556 MMBtu in Electricity and Gas Savings from Low-income Programs

In Table 15, we list the tracked energy (electric plus gas) savings and evaluated savings for each of the seven low-income programs offered by the DCSEU with claimed savings in FY2021. Overall, the DCSEU tracking database reported 55,312 MMBtu in savings, and we verified 55,146 MMBtu.[25]

Table 15: FY2021 Low-income Energy Savings by Program

Program	Track	Tracked Modified Gross Savings (MMBtu)	Evaluated Modified Gross Savings (MMBtu)
Income Qualified Gas Efficiency Fund	4335IGEF	9,095	9,009
Implementation Contractor Direct Install	7610ICDI	6,390	6,390
Income Qualified Efficiency Fund	7610IQEF	5,662	5,668
Low-income Multifamily Comprehensive	7612LICP	15,613	15,528
Low-income Prescriptive Rebate	7613LIRX	1,378	1,378
Retail Lighting Food Bank	7717FBNK	16,839	16,838
Low-income Home Energy Conservation Kit	7717HEKT	335	335
Total		**55,312**	**55,146**

Table 16 displays our assessment of DCSEU's achievement of the low-income savings benchmark. The contract requires that the DCSEU achieve a minimum of 23,278 MMBtu savings from low-income programs. The maximum target equals 46,556 MMBtu.

Our evaluation found that DCSEU achieved 55,146 MMBtu in energy savings from low-income programs, representing 237% of the minimum target and 118% of the maximum target. As discussed in more detail in Section 2.1, the cost of saved energy for low-income programs is typically multiple times greater than for other types of programs.

[25] The DCSEU tracking database reports natural gas savings in MMBtu and electricity savings in kWh. The NMR team converted kWh electricity savings to MMBtu by multiplying by a factor of 0.003412.

Table 16: FY2021 Low-income Savings Benchmark Performance

Measurement	Minimum Target	Maximum Target	Evaluated Number	Percent of Minimum Target	Percent of Maximum Target
Modified gross electric savings plus modified gross gas savings from low-income programs (MMBtu)	23,278	46,556	55,146	237%	118%

1.1.5 Increase the Number of Green-collar Jobs

This benchmark requires that the DCSEU fund green jobs in the District during each year of the contract. The contract requires that the DCSEU fund a minimum of 66 full-time equivalent (FTE) jobs each year. The maximum annual target is 88 jobs.

To calculate the number of FTE jobs funded, the contract specifies the following criteria:

- One FTE green job equals 1,950 hours worked by DCSEU staff and subcontractors.
- One FTE green job equals $200,000 worth of DCSEU incentives provided to customers or manufacturers.
- Only direct jobs are to be considered. Indirect jobs and induced jobs are not counted.

To calculate the number of green jobs funded by the DCSEU staff and subcontractors, DOEE provided a spreadsheet of payroll hours worked by the DCSEU staff and subcontractors during FY2021. The NMR team divided the total number of hours worked by 1,950 to yield the number of green jobs created by the DCSEU (Table 17).

In addition, the DCSEU provided a spreadsheet with the total incentive amount distributed in FY2021, which equaled $9,255,573. However, a portion of these incentives flowed through DCSEU subcontractors, whose jobs were already counted under the payroll hours calculation. Therefore, we excluded a total of $1,753,917 in subcontractor incentives and used the remaining $7,501,655 in customer incentives as the basis for the calculation of jobs funded due to incentives (Table 17).

Table 17: FY2021 Green Jobs Calculation

Category	Total Hours or Dollars (A)	Assumed Hours or Dollars per Job (B)	Number of Green Jobs Funded (A / B)
DCSEU Staff Hours	55,362 hours	1,950 annual hours	28.4
DCSEU Subcontractor Hours	43,721 hours	1,950 annual hours	22.4
Incentive Dollars	$7,501,655	$200,000	37.5
Total Green Jobs Created			**88.3**

Table 18 displays our assessment of the DCSEU's achievement of the green jobs benchmark. We calculated that the DCSEU funded 88.3 jobs, representing 134% of the 66 jobs minimum target and 100% of the 88 jobs maximum target.

Table 18: FY2021 Green Jobs Benchmark Performance

Measurement	Minimum Target	Maximum Target	Evaluated Number	Percent of Minimum Target	Percent of Maximum Target
Number of FTE jobs funded by the DCSEU	66	88	88.3	134%	100%

1.1.6 Leverage External Funds

The contract requires the DCSEU to secure outside funds, excluding SETF funds or other District government funds (such as Solar For All funding), to support the SETF programs implemented by the DCSEU. The DCSEU is required to obtain a total of $5,000,000 of outside funds over the five-year period of the base contract. There is no annual target for this benchmark; there is only a cumulative five-year goal. Therefore, we have assessed the DCSEU's achievement of the $5,000,000 five-year benchmark.

The DCSEU provided the NMR team with a spreadsheet listing details regarding the outside funds received during FY2021. The DCSEU reported obtaining a total of $2.7 million in outside funds during FY2021, mostly from delivering a low-income multifamily gas program for Washington Gas and participating in the PJM forward capacity market (Table 19).

Table 19: FY2021 Leveraged Funds Calculation

Funding Source	Description	Amount
PJM	Forward Capacity Market Credits	$85,894
Sergio Pombo	Miscellaneous	$211
Washington Gas	Low-Income Multifamily Gas	$2,572,832
Total		**$2,658,937**

The NMR team calculates that the DCSEU has secured a total of $5.7 million since FY2017, including the reported outside funding of $439,111 from FY2017, $268,881 from FY2018, $317,131 from FY2019 and $2,019,762 in FY2020 (Table 20).

Table 20: Leveraged Funds Annual Summary

Year	Amount
FY2021	$2,658,937
FY2020	$2,019,762
FY2019	$317,131
FY2018	$268,881
FY2017	$439,111
Total	**$5,703,822**

The $5.7 million figure represents 228% of the $2.5 million minimum target and 114% of the $5.0 million maximum target (Table 21).

Table 21: Cumulative Leveraged Funds Benchmark Performance

Measurement	Minimum Target	Maximum Target	Evaluated Number	Percent of Minimum Target	Percent of Maximum Target
Dollars received from external sources	$2,500,000	$5,000,000	$5,703,822	228%	114%

1.2 Tracking Goals and Other Metrics

In this section, we assess the DCSEU's FY2021 achievement of its two tracking goals:

1. Reduce Growth in Peak Demand
2. Reduce Growth in Energy Demand of Largest Energy Users

In addition, we present data on GHG reductions, net energy savings, and cumulative and lifetime energy savings.

1.2.1 Reduce Growth in Peak Demand

While the DCSEU is not required to offer programs to exclusively reduce peak demand, demand savings result from the electric savings programs, and the DCSEU is required to report on demand savings. Because the peak demand savings goal is for tracking purposes only, it does not have a contractual performance target. Peak demand savings can help reduce the need to add electric generation, transmission, and distribution capacity to the system. In addition, it may avoid the need to activate peak load generation which may be more expensive and produce more pollutants and GHG emissions than baseload generation.

The DCSEU tracks peak demand savings in two ways: gross meter-level savings and modified gross generator-level savings. The contract requires using modified gross generator-level peak demand savings to assess this tracking goal.

The gross meter-level savings reflect the annual peak demand savings that the customer is expected to receive at the meter. The modified gross generator-level savings are calculated by increasing all gross meter-level peak demand savings by 7.7% to adjust for line losses. The formula is displayed below.

*Modified gross peak demand savings = Gross peak demand savings * 1.077076*

The peak demand period occurs between 2:00 p.m. and 6:00 p.m. from June through September. In 2021, the peak load usage for DC was 2,093 MW.[26]

Table 22 displays the modified gross peak demand savings as tracked by the DCSEU, our calculated portfolio-level realization rate, and the evaluated modified gross peak demand

[26] 2022 Consolidated Report. Potomac Electric Power Company. April 2022. Table 2.

savings. The realization rate equals the ratio of evaluated savings to tracked savings. The NMR team estimates that the actual portfolio peak demand savings equals 17.7 MW, 104% of the DCSEU tracked peak demand savings of 17.0 MW. The 17.7 MW figure represents 0.8% of the estimated peak load usage of 2,093 MW.

Table 22: Modified Gross Summer Peak Demand Savings Verification

Measurement	Tracked Savings (MW)	Realization Rate	Evaluated Savings (MW)
Modified gross electric demand savings during summer peak period	17.0	104%	17.7

The evaluated peak demand savings of 17.7 MW for FY2021 is higher than FY2020, but less than FY2018 and FY2019 (Table 23). Because electric savings lead to demand savings, the demand savings fluctuates with electric savings.

Table 23: Evaluated Modified Gross Summer Peak Demand Savings Trends

Measurement	FY2021	FY2020	FY2019	FY2018	FY2017
Evaluated modified gross electric demand savings during summer peak period (MW)	17.7	15.3	22.4	21.4	12.4

1.2.2 Reduce Growth in Energy Demand of Largest Energy Users

While the DCSEU is not required to offer programs aimed exclusively at reducing the energy usage of large energy users, they are required to track projects with large users. Because the large user goal is for tracking purposes only, it does not have any contractual performance targets. Because large energy users consume a disproportionately large share of energy in the District, completing these projects is important to reducing overall energy usage.

The DCSEU contract's definition of a large energy user is as follows:

> *Large energy users are defined as organizations, individuals, or government entities that own a building with more than 200,000 square feet of gross floor area or own a campus of buildings in a contiguous geographic area that share building systems or at least one common energy meter without separate metering or sub-metering, such that their energy use cannot be individually tracked. Gross floor area includes infrastructure that contain heated and unheated space that is connected to a qualifying building. Energy-efficiency or renewable energy measures must be installed in a qualified building or an infrastructure connected to a qualified building in order to qualify as a large energy user project.*

The DCSEU provided a spreadsheet that lists potential FY2021 large energy users, titled Largest_Energy_Users. The spreadsheet divided the large energy users into two categories: Divisions with SPECLEU Identifier; and Divisions where Parent Company has SPECLEU Identifier. Some companies appeared in both lists. Using the addresses listed in this spreadsheet or listed with the given company ID in the tracking database, we evaluated the large energy user status of the project sites listed for these companies.

Some projects included multiple site listings. Additionally, some sites participated in multiple projects and project tracks. The number of unique site IDs participating in each track are listed in Table 24.

Table 24: FY2021 Large Energy User Sites

Program	Track	Number of Unique Sites
CI RX – Equipment Replacement	7511CIRX	13
Market Transformation Value	7512MTV	0
Commercial Upstream	7513UPLT	225
Retrofit – Custom	7520CUST	37
Market Opportunities – Custom	7520MARO	1
New Construction – Custom	7520NEWC	13
Pay for Performance	7520P4PX	1
Low-Income Multifamily Comprehensive	7612LICP	7
Residential Upstream	7725RSUP	2
Total		**299**

To confirm that the company sites met these specifications, the NMR team reviewed the building size reported by the DCSEU for these companies' project sites, when available. However, some sites were listed with a square footage of zero. To confirm building size for sites where the area is not provided, the NMR team consulted the DOEE Covered Building List for 2021, which lists buildings over 50,000 gross square feet in the DC tax records. For locations not listed in this document, we sought external verification through institution websites, news articles, or government documents.

Based on input from DCSEU, the NMR team analyzed large energy users at the site level. Sites that only participated in the Commercial Upstream track were not counted as large energy users since there is no verification activity for these projects. Instead, each Commercial Upstream company is counted as a single large energy user. The Commercial Upstream/Midstream Lighting Program provides customers with point-of-purchase discounts when they buy qualified lighting products from participating distributors. There was sufficient data to confirm that 13 of the associated site IDs were not large energy users as they did not meet the 200,000 square foot threshold. The NMR team was unable to verify 117 site IDs due to insufficient data, but we were able to verify that 169 of the 299 site IDs were large energy users exclusive of the Commercial Upstream Program.

There are a similar number of completed projects with large energy users in FY2021 as in FY2020, which is greater than prior years (Table 25).

Table 25: Evaluated Large Energy User Trends

Measurement	FY2021	FY2020	FY2019	FY2018	FY2017
Number of large energy users with completed projects	169	165	89	127	104

1.2.3 Greenhouse Gas Reductions

Table 26 displays the avoided CO2 emissions in annual metric tons since FY2017 based on the evaluated gross savings, including line losses to reflect electric savings at the generator rather than the customer. The NMR team utilized a GHG emissions calculator spreadsheet from DOEE to calculate the avoided annual GHG emissions assuming 652 lbs. of CO2 equivalent per MWh, which we understand reflects an average emissions rate across the fleet of electric generators.[27] Overall, we estimate the DCSEU's programs saved an estimated 241,211 metric tons of annual CO2 emissions since FY2017 using the average emission rates. The FY2021 avoided emissions of 37,292 metric tons represents about 0.5% of the estimated District-wide emissions of 7,172,238 metric tons from 2019.

We also calculated CO2 emission reductions based on marginal emission rates because they more accurately reflect the impact of energy-efficiency and renewable energy programs on displacing generation across the fleet.[28] Energy-efficiency and renewable energy programs "are not generally assumed to affect baseload power plants that run all the time, but rather marginal power plants that are brought online as necessary to meet demand."[29] We estimated an annual weighted average marginal emissions rate that is consistent with the cost-effectiveness testing employed by the SEU and our evaluation and is based on the savings accumulated during each of four seasonal costing periods.[30] This calculation yielded an annual marginal emissions rate of 1,234 lbs. of CO2 per MWh and yielded FY2021 avoided emissions of 64,652 metric tons.

[27] The average GHG emission rates are calculated using a DOEE spreadsheet tool for 2020. The spreadsheet employs the method from the IPCC 5th Assessment GWP with a 100 year horizon. The electricity factors are from 2020 eGRID RFC-East.

[28] The marginal CO2 emission rates are based on 2019 PJM estimates. *PJM 2015 – 2019 CO2, SO2 and NOX Emission Rates*. April 9, 2020. https://www.pjm.com/~/media/library/reports-notices/special-reports/2019/2019-emissions-report.ashx

[29] https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

[30] The four costing periods are summer on peak, summer off peak, winter on peak, and winter off peak. Each of these periods has a different marginal emissions rate and energy cost, and the single weighted average marginal emissions rate reflects the relative prevalence of energy savings among each period.

Table 26: Greenhouse Gas Emission Reductions

Year	Avoided GHG Emissions (Metric Tons)	
	CO2 Equivalent, Average Emission Rates	CO2, Marginal Emission Rates
FY2021	37,292	64,652
FY2020	44,602	74,772
FY2019	63,450	107,758
FY2018	55,478	92,963
FY2017	40,389	66,147
Total	**241,211**	**406,292**

1.2.4 Net Energy Savings

Table 27 displays the net energy savings for FY2021, which adjusts the gross savings for both free-ridership and participant spillover. Free-ridership reflects the portion of program savings that would have occurred in the absence of the program. Participant spillover manifests in participating customers who take actions that lead to additional savings beyond the tracked program savings and without financial assistance.

Overall, the net modified savings represent 62% of the gross modified savings for electricity, 60% for gas, and 62% across both fuels. The NTG ratio is lower for gas than electric because most gas savings derive from the Custom Retrofit program, which has one of the lowest NTG ratios among the DCSEU commercial programs.

Table 27: FY2021 Net Modified Energy Savings

	Electric Savings (MWh)	Gas Savings (Therms)	Total Energy Savings (MMBtu)
Gross Modified Savings	104,228	1,619,344	517,561
Net Modified Savings	65,109	966,903	318,843
Net-to-Gross Ratio (Net / Gross)	62%	60%	62%

The estimated portfolio NTG value for DCSEU equaled 60% in FY2020, 61% in FY2019 and 56% in FY2018. In comparison, the most recent portfolio NTG values for PECO[31] and BG&E[32] are 76% and 72%, respectively.

1.2.5 Cumulative Annual Energy Savings

Table 28 displays the annual modified gross energy (electric plus gas) savings. We estimate the DCSEU programs yielded energy savings of about 517,561 MMBtu in FY2021 and 3,084,661

[31] Pennsylvania SWE Annual Report, Act 129 Phase III and Program Year 12. NMR Group, Demand Side Analytics, Brightline Group, and Optimal Energy. March 31, 2022. http://www.puc.state.pa.us/filing_resources/issues_laws_regulations/act_129_information/act_129_statewide_evaluator_swe_.aspx

[32] *Verification of the 2020 Empower Maryland Electric Utility Energy Efficiency Program Impact and Cost Effectiveness Evaluations*. Loper Energy, Hungeling Analytics, and Tierra Resource Consultants. October 29, 2021.

MMBtu since FY2017. The 517,561 MMBtu figure represents about 0.7% of 2014 weather-normalized DC consumption.

Table 28: Annual Modified Gross Energy Savings

Year	Tracked Modified Gross Savings (MMBtu)	Realization Rate	Evaluated Modified Gross Savings (MMBtu)
FY2021	517,793	100%	517,561
FY2020	582,633	102%	594,280
FY2019	803,441	96%	773,286
FY2018	693,722	99%	683,487
FY2017	531,997	97%	516,047
Total	**3,129,586**	**99%**	**3,084,661**

1.2.6 Lifetime Energy Savings

Table 29 displays the modified gross electric savings projected over the lifetime of the measures. Since FY2017, the DCSEU programs are projected to save about 6.6 million MWh in lifetime electric savings, which equals about 22,403,551 MMBtu. The NMR team calculated the lifetime savings for each measure by multiplying the first-year energy savings by its expected lifetime. Because certain measures are subject to increased efficiency standards in the future, the lifetime savings may be adjusted to reflect this situation.

Table 29: Lifetime Modified Gross Electric Savings

Year	Tracked Lifetime Modified Gross Savings (MWh)	Realization Rate	Evaluated Lifetime Modified Gross Savings (MWh)
FY2021	1,058,833	99%	1,045,893
FY2020	1,100,670	102%	1,118,104
FY2019	1,807,714	99%	1,784,211
FY2018	1,507,610	99%	1,496,844
FY2017	1,140,086	98%	1,121,053
Total	**6,614,913**	**99%**	**6,566,105**

Table 30 displays the lifetime modified gross gas savings. Overall, the FY2017 through FY2021 programs are projected to save about 104 million therms in lifetime gas savings, which equals about 10,422,335 MMBtu. The NMR team calculated lifetime savings for each measure by multiplying the first-year energy savings by its expected lifetime. Because certain measures are subject to increased efficiency standards in the future, the lifetime savings may be adjusted to reflect this situation.

Table 30: Lifetime Modified Gross Gas Savings

Year	Tracked Lifetime Modified Gross Savings (Therms)	Realization Rate	Evaluated Lifetime Modified Gross Savings (Therms)
FY2021	22,081,674	100%	22,033,489
FY2020	21,100,023	101%	21,220,847
FY2019	24,817,702	96%	23,813,001
FY2018	18,562,650	102%	18,850,804
FY2017	20,298,108	90%	18,305,207
Total	**106,860,157**	**98%**	**104,223,348**

Section 2 Cost-effectiveness Assessment

In this section, we describe our evaluation efforts to assess the cost of saved energy and the cost-effectiveness of the DCSEU programs.

2.1 Cost of Saved Energy

To inform future planning of budgets and savings goals, we calculated the DCSEU's cost of first-year verified energy savings in FY2021. To calculate the cost of saved energy, the DCSEU provided the NMR team with program-specific incentive costs for electric and natural gas measures, as well as portfolio-wide administrative and support costs for FY2021. To calculate total electric and natural gas costs, we allocated the portfolio-wide administrative and support costs to each program and fuel type based on its program-specific incentive cost. We then summed the total costs by fuel type and program. To calculate the cost of saved energy, we divide reported annual costs by evaluated annual savings.

Because renewable energy projects may have a different cost per unit of savings than energy-efficiency projects, we calculated costs separately for energy efficiency vs. renewable energy. Therefore, we provide the costs for three categories of savings:

1. Electric savings from energy efficiency programs
2. Electric savings from renewable energy programs
3. Natural gas savings

As described in Section 1.1.1, modified gross electricity savings exceed gross electricity savings due to adjustments for line losses. In addition, as described in Section 1.1.2, modified gross gas savings exceed gross gas savings due to the exclusion of cross-fuel interactive effects. Therefore, the DCSEU's costs for modified gross energy savings are less than the costs for gross energy savings. We calculate costs for both types of savings because gross savings are more directly comparable to other jurisdictions, while the performance benchmarks are based on modified gross savings.

We calculated that the DCSEU's FY2021 cost for first-year gross and modified gross electricity savings from energy efficiency programs was $43/MMBtu and $41/MMBtu, respectively (Figure 5 and Figure 6). In addition, we calculated that the DCSEU's cost for gross and modified gross electricity savings from renewables programs was $10/MMBtu. For natural gas savings, we calculated that the DCSEU's cost of gross and modified gross savings was $66/MMBtu and $48/MMBtu, respectively.

While the costs of portfolio-wide gross energy savings decreased from $42/MMBtu in FY2017 to $27/MMBtu in FY2019, the energy costs have since steadily increased to $47/MMBtu in FY2021 (Figure 5). As shown in Figure 8, the cost of energy savings for low-income programs sharply increased in FY2020 but then declined in FY2021; the overall two-year increase is about 18%. The cost of energy savings for non-low-income programs has also increased, albeit more steadily – by about 7% in FY2020 and another 18% in FY2021. While these factors contribute to the increase in the portfolio cost of energy savings, the primary driver is increased spending on the higher cost low-income programs. Low-income spending almost doubled between FY2019

and FY2021 mostly due to the launch of a low-income multifamily gas program for Washington Gas.

Figure 5: DCSEU Trends for Costs of First-year Gross Energy Savings

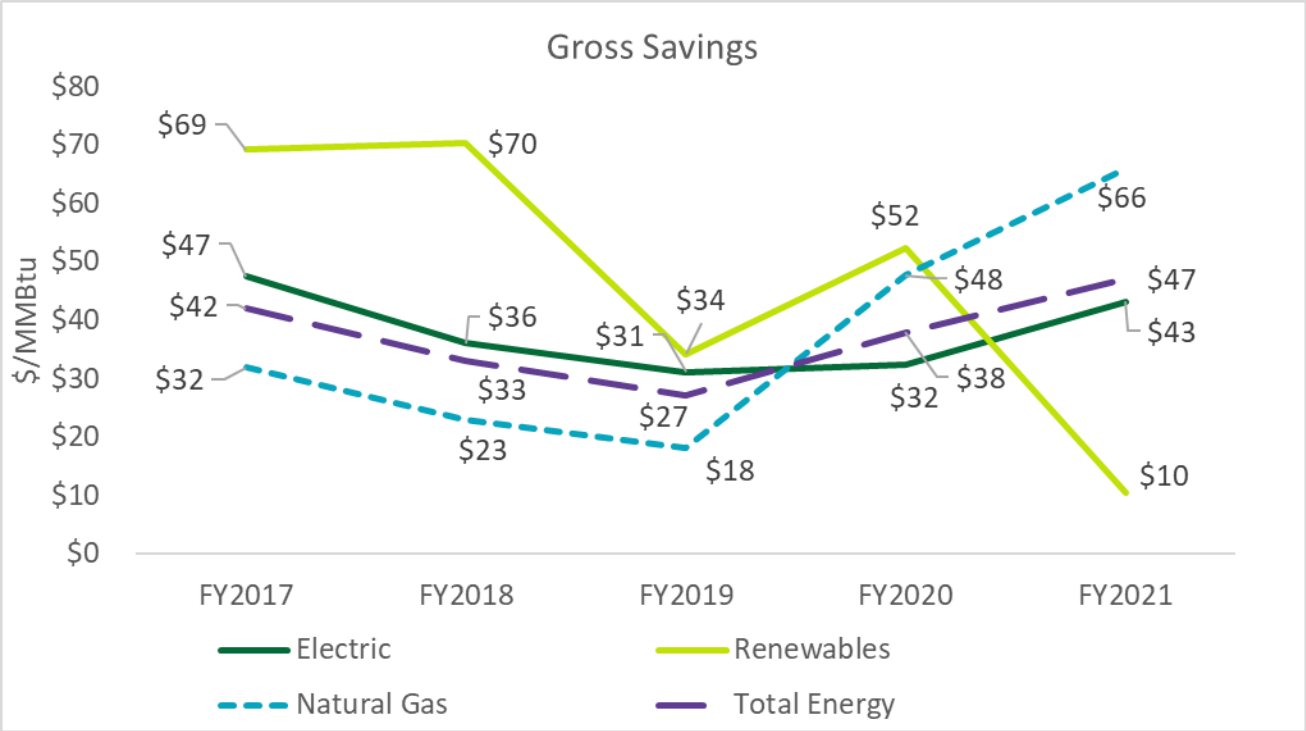
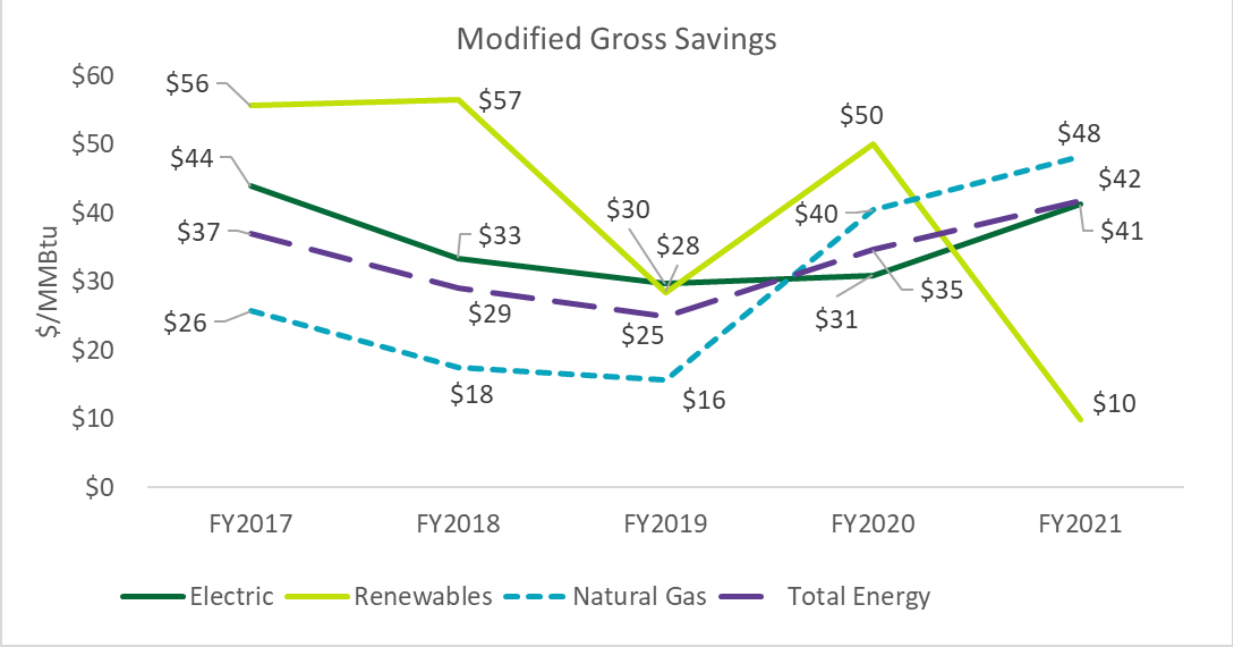


Figure 6: DCSEU Trends for Costs of First-year Modified Gross Energy Savings



To compare the cost of saved electricity to the cost of saved gas, we converted the gas savings from therms to a MWh equivalent.[33] Over the past two years, the cost of gross gas savings has been about 50% higher than the cost of gross electricity savings, after being lower by one-third or more in the prior three years.

Table 31: DCSEU Comparison of Costs of First-year Gross Energy Savings

Fuel Savings Type	FY2021	FY2020	FY2019	FY2018	FY2017
Electric savings, excluding renewables programs	$147/MWh	$110/MWh	$106/MWh	$123/MWh	$162/MWh
Gas savings equivalent	$225/MWh	$163/MWh	$62/MWh	$78/MWh	$109/MWh
Ratio of Gas Cost to Electric Cost	152%	147%	58%	63%	67%

Due to the similar geographic location and climate, we compare the DCSEU's costs of first-year electricity savings to those from two nearby utilities: PECO Energy in Pennsylvania and Baltimore Gas & Electric (BG&E) in Maryland. In addition, we compare DCSEU's costs of first-year gas savings to the costs for Philadelphia Gas Works (PGW), which serves the city of Philadelphia. While these comparisons are useful, it is important to understand that these jurisdictions have different markets, savings goals, regulatory requirements, cost-effectiveness tests, program maturity, and delivery systems, which may affect both costs and savings.

PECO Energy serves the city of Philadelphia and surrounding counties, which are less urban than DC. PECO is subject to Pennsylvania's Act 129, which requires that energy-efficiency programs achieve nearly a 4% cumulative reduction in annual electricity use (or approximately 0.8% per year) over the five-year period of the Phase III programs that launched in 2016. In addition, at least 5.5% of savings must come from programs solely directed at low-income customers in multifamily housing and at least 3.5% from government, non-profit, and institutional organizations. Pennsylvania Act 129 requires the portfolio of programs offered by each electric distribution company to be cost-effective using a modified version of the Total Resource Cost (TRC) test. The TRC typically includes a more limited range of benefits than the Societal Cost Test (SCT) employed by DC.

BG&E services the city of Baltimore, as well as surrounding counties, which are less urban than DC. Beginning with the 2016 program year, the Maryland EmPOWER programs are designed to achieve an annual incremental gross energy savings equivalent of 2.0% of the weather normalized gross retail sales baseline, with a ramp-up rate of 0.2% per year. The programs are screened on four factors: cost-effectiveness, impact on the rates of each ratepayer class, impact on jobs, and impact on the environment. Maryland requires that each utility's programs be cost-effective at both the residential and commercial sector-level using the TRC test.

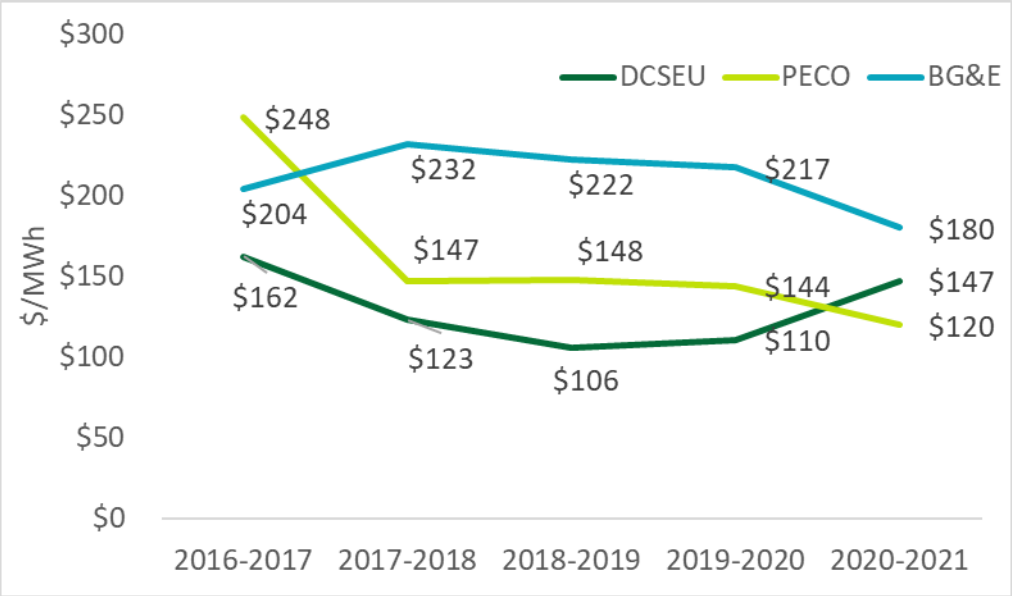
In comparison, the DCSEU has multiple benchmarks – in particular low-income and green jobs – that may impact costs. In addition, the DCSEU FY2021 electric energy efficiency program budget represents about 20% of PECO's budget and about 12% of BG&E's budget, although

[33] We converted therms to MWh by first dividing by 10 therms per MMBtu then dividing by 3.412 MMBtu per MWh.

DCSEU's gas program budget is over eight times greater than PGW. To facilitate the comparison with PECO and BG&E, we calculated the total electric program budget per electric customer.[34] In FY2021, DCSEU spent about $51 per customer while PECO spent about $57 per customer and BG&E spent about $110 per customer.

At $147/MWh, the DCSEU's FY2021 cost for gross electricity savings is less than BG&E's cost ($180/MWh) but higher than PECO's cost at $120/MWh (Figure 7).[35,36] Because PECO and BG&E only offer electric energy-efficiency programs, we only compare the costs to save electricity.

Figure 7: Comparison of Costs of First-year Gross Electricity Savings



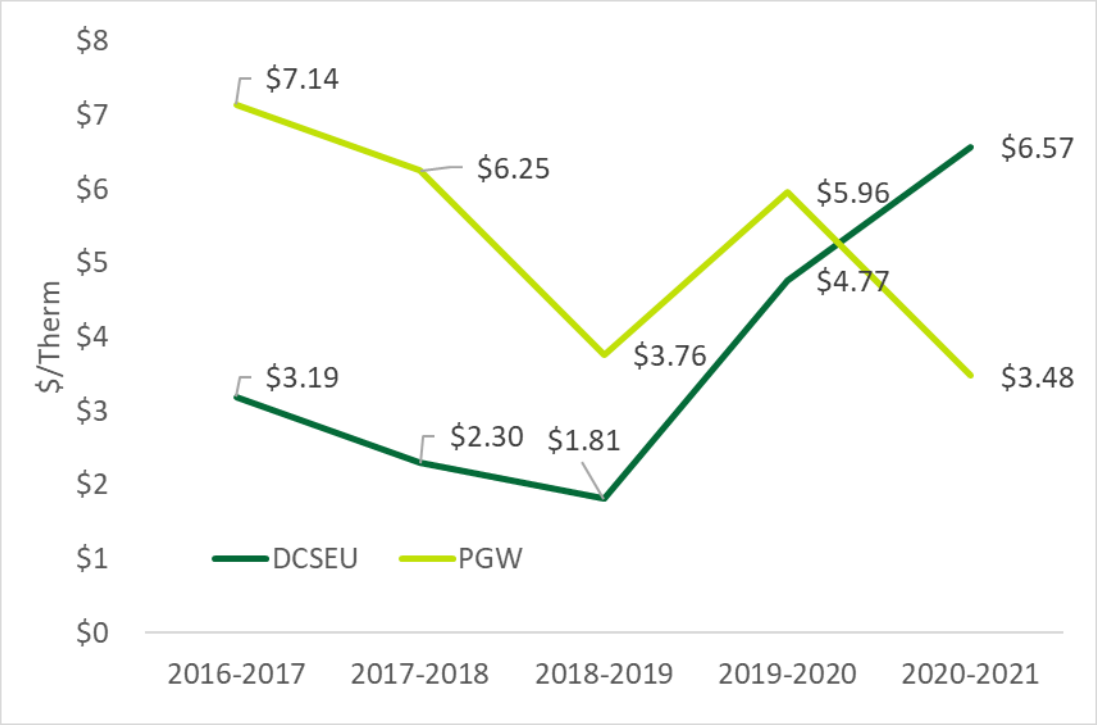
[34] Customer counts were obtained from EIA 2020 Utility Bundled Sales to Ultimate Customers, Table 10. https://www.eia.gov/electricity/sales_revenue_price/

[35] *Verification of the 2020 Empower Maryland Electric Utility Energy Efficiency Program Impact and Cost Effectiveness Evaluations*. Loper Energy, Hungeling Analytics, and Tierra Resource Consultants. October 29, 2021. *The Empower Maryland Energy Efficiency Act Report of 2021 with Data for Compliance Year 2020*. Maryland Public Service Commission. April 2021.

[36] Pennsylvania SWE Annual Report, Act 129 Phase III and Program Year 12. NMR Group, Demand Side Analytics, Brightline Group, and Optimal Energy. March 31, 2022. http://www.puc.state.pa.us/filing_resources/issues_laws_regulations/act_129_information/act_129_statewide_evaluator_swe_.aspx

At $6.57/therm, the DCSEU's FY2021 cost for gross gas savings is greater than the cost for PGW ($3.48/therm) for September 2020 to August 2021 (Figure 8).[37] The increased DCSEU gas costs is largely due to rising costs for the Custom tracks as well as the launch of the Washington Gas Income Qualified Gas Efficiency Fund program in FY2020.

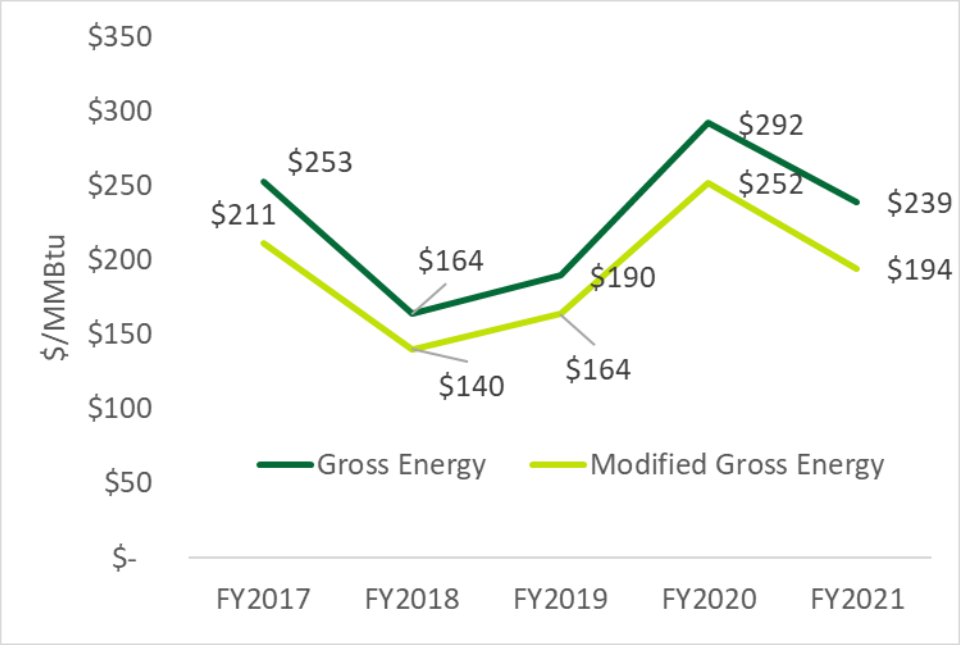
Figure 8: Comparison of Costs of First-year Gross Gas Savings



[37] *Demand Side Management Program Annual Report, FY 2021 Results.* Philadelphia Gas Works. December 2021.

Figure 8 displays the costs of saved energy across all seven DCSEU low-income programs listed in Table 15. The costs of gross and modified gross energy savings have fluctuated over the past five years – first declining, then increasing, and then declining again in FY2021.

Figure 9: Costs of First-year Energy Savings for Low-income Programs



Because low-income projects typically require greater levels of program investment, the costs of saved energy are higher than for other types of programs. We calculated the cost of saved electricity for DCSEU's low-income programs to be about eight times greater than the cost of non-low-income programs. This is similar, though higher, than the findings from a national study that estimated the cost of saved electricity for low-income programs as approximately four times greater than for other types of programs.[38]

The cost to reduce GHG emissions in FY2021 equals $334 per metric ton of CO2 based on the marginal emissions rate.

[38] *The Cost of Saving Electricity Through Energy Efficiency Programs Funded by Utility Customers: 2009–2015.* Lawrence Berkeley National Laboratory. June 2018.

2.2 COST-EFFECTIVENESS ASSESSMENT

The NMR team modeled the cost-effectiveness of the DCSEU FY2021 program offerings at the portfolio level and for each of the programs that were active in FY2021. In this section, we report results for the core SETF programs. Appendix C contains results for the two Solar for All (SFA) programs, which are funded separately from the SETF. We did all of our modeling using a Societal Cost Test (SCT) perspective. The SCT is a variant of the TRC Test, which includes various externalities and a lower societal discount rate than the discount rate based on the utility weighted average cost of capital used in the TRC. The discount rate determines the net present value of future resource savings. Table 32 lists the cost and benefit elements included in the SCT Test.

Table 32: Societal Cost Test – Costs and Benefits

SCT Costs	SCT Benefits
Incremental Measure Cost	Avoided Energy Costs (kWh, MMBtu)
Other Financial or Technical Support Costs	Avoided Generating Capacity Costs
Program Administration Costs	Avoided T&D Capacity Costs
NMR Evaluation, Measurement, & Verification (EM&V) Costs	Avoided Water Costs
DOEE Oversight Costs	Reduced Risk/Increased Reliability
	Reduced Operation and Maintenance (O&M) Costs
	Benefits from reducing environmental externalities, including air and water pollution, GHG emissions, and cooling water use.
	Non-energy Benefits (NEBs), including comfort, noise reduction, aesthetics, health and safety, ease of selling/leasing home or building, improved occupant productivity, reduced work absences due to illness, ability to stay in home/avoided moves, and macroeconomic benefits.

The primary data sources that the NMR team used for the cost-effectiveness assessment were as follows:

- Measure-level energy savings, effective useful life (EUL) assumptions, incremental measure cost values, incentive amounts, and projections of O&M savings from the DCSEU tracking database.
- Non-incentive expenditures for program administration and delivery, as provided by the DCSEU. This includes both costs that were allocated to specific tracks and common costs for support services that are assigned at the portfolio level.
- Avoided cost assumptions, as documented in a series of memos and workbooks that outline the latest values. These values are provided in Section 2.2.1.
- Realization rates and net-to-gross ratios, as determined by the FY2021 impact evaluation.

In addition to the detailed information contained in the DCSEU program tracking database, the DCSEU provided the NMR team with its own cost-effectiveness findings for FY2021. The DCSEU calculated a portfolio SCT ratio of 1.87 with $70 million of net benefits at the portfolio level for FY2021. As a first step in the analysis, the NMR team developed a parallel set of calculations using DCSEU inputs, assumptions, and formulas. This analysis returned a portfolio SCT ratio of 1.89 and $71.6 million in net benefits. After closely replicating the DCSEU model, the NMR team made a few adjustments to address different assumptions. The NMR team produced three additional cost-effectiveness scenarios using different inputs and assumptions. The additional scenarios are described below. The results are summarized in Table 33 and presented in detail in Section 2.2.2.

- ***Scenario #1 – Modified Replica:*** Replicates the DCSEU calculations with corrections to inputs and formulas. The first modification in Scenario #1 was formulaic and was also noted in the FY2017, FY2018, FY2019, and FY2020 evaluation reports. Some measures have interactive effects on other fuels. For example, installation of cooler LED lighting increases the consumption of fossil fuel heating systems because there is less waste heat in the space. The DCSEU treated this heating *penalty* as a cost for fossil fuels and a benefit for electricity and water. The NMR team standardized the accounting across resources and treated all interactive penalties (and associated externalities) as a negative benefit. This does not affect the Present Value of Net Benefits (PVNB) calculation but does change the SCT ratios because dollars are moved from the denominator to the numerator. The DCSEU model also redefines the *present* for costs by inflating costs by half a year. The modified replica model assumes all costs occur in the present, in current dollars, and does not apply a cost adjustment.
- ***Scenario #2 – Gross Verified Savings****:* This scenario incorporates the realization rates as determined by the impact evaluation. Realization rates are applied to the first-year savings and future adjusted savings (in the case of measures with dual baselines) equally.
- ***Scenario #3 – Net Verified Savings****:* This scenario adjusts the reported savings in the DCSEU system by both the realization rate and net-to-gross (NTG) ratio. Regardless of program delivery mechanism (incentive vs. direct install), incremental measure costs are discounted by the applicable free-ridership rate.

Appendix A provides descriptions for each of the program tracks offered by the DCSEU in FY2021. The program groupings shown in Table 33 and subsequent tables are a function of the way DCSEU reports direct costs. DCSEU provided direct costs at the four-digit *job* level and some jobs include multiple tracks. For example, job number 7520 includes four Commercial Custom tracks: Retrofit (7520CUST), Market Opportunities (7520MARO), New Construction (7520NEWC), and Pay for Performance (7520P4PX).

Table 33: Societal Cost Test Ratios by Scenario

Program	DCSEU Replica	Modified Replica Scenario #1	Gross Verified Savings Scenario #2	Net Verified Savings Scenario #3
C& I RX - Equipment Replacement/Small & Medium Business Rebates	5.69	6.36	6.58	6.26
Retrofit/Market Opportunity/New Constriction/Pay for Perform - Commercial Custom	1.99	2.03	2.01	1.90
Market Transformation Value	2.91	3.04	3.41	3.28
Commercial Midstream - Lighting	5.34	5.93	6.26	6.13
Low-income Multifamily Comprehensive	1.80	1.84	1.83	1.83
Income Qualified Gas Efficiency Fund	1.15	1.16	1.17	1.17
Low Income Prescriptive Rebate	2.38	2.65	2.65	2.65
Retail Efficient Appliances/Heating and Cooling/Lighting/Seasonal Savings	2.25	2.44	2.45	2.32
Retail Lighting Food Bank/Home Energy Conservation Kit - Low-income	6.47	12.35	12.35	12.35
Residential Midstream	5.43	6.68	6.68	5.54
Solar PV Market Rate	1.31	1.33	1.33	1.29
Innovation - Market Rate	0.00	0.00	0.00	0.00
Total Job Level	**2.05**	**2.12**	**2.12**	**2.14**
Total Portfolio Level with Administrative Cost	**1.89**	**1.93**	**1.94**	**1.84**
Portfolio Level with EM&V and DOEE Oversight Costs	**1.84**	**1.89**	**1.90**	**1.77**

Incentives are neither a cost nor a benefit in the SCT Test. The incremental cost of the efficient measure is included in the SCT regardless of the proportion paid by the participant and program administrator. Program administration costs are treated as a cost in the SCT and include planning, IT, marketing, customer service, and all other non-incentive costs. Table 34 provides a breakdown of the FY2021 cost elements after moving increased fuel consumption to the benefits side of the ledger. These costs are only for the core SETF programs; a similar table of SFA-specific costs is presented in Appendix C.

Table 34: FY2021 Cost Summary

Parameter	Cost Component	FY2021 Portfolio Total
A	Incentive Payments	$9,268,264
B	Participant Cost (Net of Incentives)	$61,725,875
C	Incremental Measure Cost (A + B)	$70,994,138
D	Track-specific Administrative Costs (Non-incentive)	$3,111,558
E	Portfolio Administrative Costs	$6,651,700
F	Total Program Administration Cost (D+E)	$9,763,258
G	**Total SCT Costs (C+F)**	**$80,757,396**
H	DOEE Oversight and NMR EM&V Costs	$1,810,746
I	**Total SCT Costs with Oversight and EM&V (C+F+H)**	**$82,568,142**

There are two different bins of administrative costs listed in Table 34. The track-specific administrative costs (Parameter D) are allocated to a specific program track, and therefore are included as a cost in the track-level SCT results. The portfolio-level results presented in this report include both the track-specific administrative costs and the portfolio administrative costs (Parameter E). This is the same approach used by the DCSEU to calculate cost-effectiveness and is commonly used by other states and utilities.

The implication of this methodology is that each of the track-level results is slightly overstated because the SCT ratio does not reflect its share of costs allocated to the portfolio as a whole. If track-level cost-effectiveness results are important to DOEE, we could work with the DCSEU to develop an allocation method. Possible allocation approaches could include kWh contribution, MMBtu contribution, or spending (Parameters A + D). Parameter H includes costs of oversight from DOEE and the NMR team's EM&V costs for the core SETF programs. The total SCT costs with oversight are presented in Parameter I. As in prior years' reports, all references to SCT ratios do not include the DOEE Oversight and NMR EM&V costs contained in Parameter H unless otherwise noted.

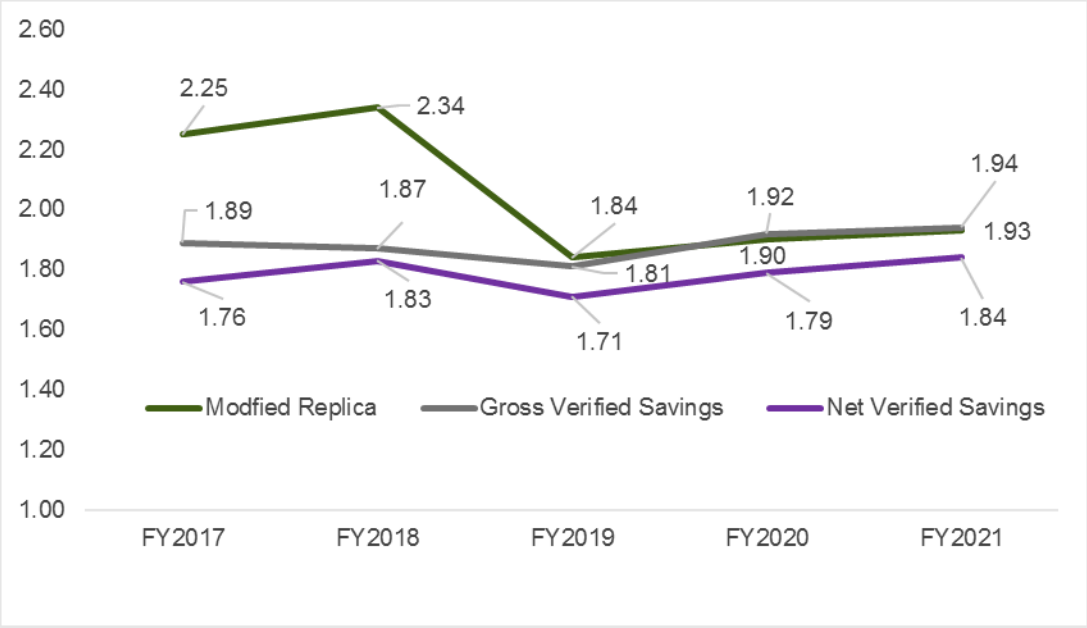
The DCSEU takes a strong position on the valuation of non-energy benefits (NEBs). In addition to a general 5% adder for the items listed in Table 32, a $100 per short ton ($110.23 per metric ton) benefit is assigned to all avoided CO2 emissions. In our modified replica model, the NEBs (general 5% adder for select items plus $100 per short ton for CO2) account for 56% of all SCT benefits. For the remaining scenarios, NEBs represent approximately the same percent of all SCT benefits. Without NEBs, the portfolio ratios are closer to one, at 1.08, 1.09, and 1.04 for Scenarios #1, #2, and #3, respectively. Table 35 shows the estimated lifetime reduction in CO2 emissions attributable to FY2021 programs by scenario, using the marginal emissions rate assumptions (marginal emissions rates were used to calculate all SCT results).

Table 35: Lifetime CO2 Emission Reductions – FY2021 Programs

Scenario	Lifetime Avoided CO2 Emissions (Metric Tons)
1 – Modified Replica	568,140
2 – Gross Verified Savings	561,363
3 – Net Verified Savings	332,462

Figure 10 displays the SCT results from FY2017 to FY2021. Compared to prior years, the modified replica results declined starting in FY2019 because DCSEU applied our recommended updated avoided cost assumptions. However, the gross verified savings and net verified savings results are similar each year. The SCT results for FY2021 are similar to FY2020, reflecting routine annual updates to avoided costs and benefits and changes to the portfolio composition.

Figure 10: DCSEU Societal Cost Test Ratio Trends



2.2.1 Avoided Costs

For FY2021, the DCSEU model, as well as the three presented scenarios, use the same avoided cost assumptions. Table 36 summarizes the values and sources applied by DCSEU in their cost-effectiveness testing.

Table 36: FY2021 Avoided Cost Summary

Screening Assumption	Value	Source
Future Inflation Rate	1.760%	Based on the past ten years of consumer price index data published by the U.S. Labor Department for the month of August.
Water Avoided Cost	$3.13/CCF	Approved_fy_2018_operating_and_capital_budgets_final.pdf, 2017 Engineering Feasibility Report WATER.pdf
Real Discount Rate	2.677%	10-year treasury rate posted in the Wall Street Journal on the first business day of October 2020 (0.677%) plus 2% (as specified in the DC SEU contract no. DOEE-2016-C-0002).
Line Losses	1.046 (energy) 1.077 (demand)	PEPCO Zone Capacity and Transmission Peak Load Calculations for Year 2018.
Natural Gas Capacity Adder	5%	Per Section C.40.10.3 of contract DOEE-2016-C-0002.
Transmission Cost	$32.32/kW-year	PEPCO's 2020 filing of the FERC formula transmission rate update.
Distribution Cost	$65.17/kW-year	Distribution rate deduced from the 2017 DC Public Commission order re: Pepco distribution rate increase request.
Electric & Fuel Externalities	$100 per short ton of CO2 (2,000 pounds) ($110.23 per metric ton)	Avoided Energy Supply Components in New England: 2018 Report and PJM's 2013-2017 CO2, SO2, and NOx Emissions Rate Report, published in March 2018.
Electric Energy Cost	Forecast by Year and Period	Hourly real-time locational marginal prices (LMPs) for PEPCO zone from January 2015 to May 2018 are used in conjunction with hourly load data for PEPCO zone for the same period to calculate load-weighted marginal price by energy period. This establishes the 2017 value. Price escalation over the remainder of the forecast horizon (2018-2050) is calculated by averaging growth projections from a series of EIA Annual Energy Outlook forecasts for the Mid-Atlantic region.
Generation Capacity	Actual Clearing Prices for PJM delivery years with completed auctions. $69.10/kW-yr for 2023 and beyond	PJM Base Residual Auction clearing prices for PEPCO zone. Historic prices used for forecasting.
Natural Gas Cost	Forecast by Year and Sector	Projected prices for the industrial sector (Mid-Atlantic region) are adopted from the EIA Annual Energy Outlook 2019 supporting tables for energy price by sector and source.
Other Fuels Cost	Forecast by Year, Fuel, and Sector	Projected prices for the industrial sector (Mid-Atlantic region) (where possible, transportation sector used as a substitute for kerosene cost) are adopted from the EIA Annual Energy Outlook 2019 supporting tables for energy price by sector and source.
Risk Adder	5%	Specified in the DCSEU contract no. DOEE-2016-C-0002.
NEB Adder	5%	Specified in the DCSEU contract no. DOEE-2016-C-0002.

2.2.2 Cost-effectiveness Results

Table 37 presents the results of the NMR team's modified replica model. This scenario utilizes the reported gross savings values as stored in the program tracking system and the same array of avoided costs as DCSEU's calculations but incorporates a set of modifications. Of the 12 program groups, 11 are cost-effective in this scenario. The portfolio is estimated to achieve $72.5 million of net benefits (benefits minus costs). The program that was not cost-effective has zero tracked benefits for the SCT analysis. This is not unusual for new programs or programs that are designed to support the benefits of related programs. The SCT ratio is 1.93; the DCSEU analysis found a lower ratio of 1.87.

- The NMR model treats increased fossil fuel usage as a negative benefit rather than a positive cost. It is more appropriate to compare net benefit figures because the DCSEU model differed from the NMR team model in its treatment of interactive effects between space conditioning and lighting, as discussed in the Scenario #1 description.
- There were some differing cost and benefit values between the DCSEU results summary and the NMR team's replica model using the detailed program tracking data. The NMR team treated all cost data in the program tracking system as nominal 2021 dollars. DCSEU's model inflates all measure costs by a half-year, effectively assuming that costs occur in future dollars. In contrast, the NMR team's model follows the industry-standard accounting assumption that costs are incurred in the present and no temporal adjustment is made to costs. In addition, the 2021 tracking data uses a mix of 2016 and 2021 as the present value base year, and the entries with 2016 present value base year are actually in 2021 dollars.
- For commercial lighting projects, when site-specific hours of operation are utilized instead of TRM default assumptions, DCSEU scales the avoided capacity benefits by the ratio of the site-specific operating hours to the TRM default assumptions. The spirit of the DCSEU adjustment is correct – coincidence factors tend to be correlated with hours of operation. However, we recommend making the adjustment to the kW impacts themselves, rather than the capacity benefits. In the NMR replica model, any differences between the site-specific assumptions and the TRM default assumption are reflected in the demand realization rate, incorporated into Scenario #2 and Scenario #3.

Table 37: Scenario #1 Modified Replica – SCT Results

Program	Sector	SCT Benefit ($1,000)	SCT Cost ($1,000)	SCT Net ($1,000)	SCT Ratio
C& I RX - Equipment Replacement/Small & Medium Business Rebates	Commercial	$10,108	$1,590	$8,518	6.36
Retrofit -Commercial Custom/Market Opp – Commercial Custom/New Construction - Commercial Custom/Pay for Performance	Commercial	$74,053	$36,488	$37,565	2.03
Market Transformation Value	Commercial	$473	$156	$317	3.04
Commercial Midstream - Lighting	Commercial	$15,560	$2,623	$12,938	5.93
Low Income MF Comprehensive	Residential	$7,034	$3,822	$3,211	1.84
Implementation Contractor DI/Income Qualified Efficiency Fund	Residential	$2,992	$2,569	$424	1.16
Low Income Prescriptive Rebate	Residential	$294	$111	$183	2.65
Retail Efficient Appliances	Residential	$12,573	$5,149	$7,423	2.44
Retail Lighting Food Bank	Residential	$2,848	$231	$2,617	12.35
Residential Midstream	Residential	$7	$1	$6	6.68
Solar PV Market Rate	Solar	$24,130	$18,206	$5,924	1.33
Innovation - Market Rate	Residential	$0	$3	-$3	0.00
Total Portfolio Level	**Portfolio**	**$150,071**	**$77,601**	**$72,470**	**1.93**
Portfolio Level with EM&V and DOEE Oversight Costs	**Portfolio**	**$150,071**	**$79,411**	**$70,660**	**1.89**

Table 38 presents the results for Scenario #2. The electric energy, peak demand, and natural gas savings realization rates developed through the FY2021 impact evaluation were generally close to 100%, so the Scenario #2 SCT results are similar to Scenario #1 at the portfolio level. In this scenario, 11 of the 12 program groups are cost-effective. Not including EM&V and oversight costs, the portfolio is estimated to achieve $73.2 million of net benefits (benefits minus costs). The one program that is not cost-effective has SCT benefits of zero dollars because benefits were not tracked for this program, as was the case in Scenario #1.

Table 38: Scenario #2 Gross Verified Savings – SCT Results

Program	Sector	SCT Benefit ($1,000)	SCT Cost ($1,000)	SCT Net ($1,000)	SCT Ratio
C& I RX - Equipment Replacement/Small & Medium Business Rebates	Commercial	$10,469	$1,590	$8,879	6.58
Retrofit -Commercial Custom/Market Opp – Commercial Custom/New Construction - Commercial Custom/Pay for Performance	Commercial	$73,430	$36,488	$36,943	2.01
Market Transformation Value	Commercial	$532	$156	$376	3.41
Commercial Midstream - Lighting	Commercial	$16,421	$2,623	$13,798	6.26
Low Income MF Comprehensive	Residential	$7,012	$3,822	$3,190	1.83
Implementation Contractor DI/Income Qualified Efficiency Fund	Residential	$3,002	$2,569	$433	1.17
Low Income Prescriptive Rebate	Residential	$294	$111	$183	2.65
Retail Efficient Appliances	Residential	$12,592	$5,149	$7,443	2.45
Retail Lighting Food Bank	Residential	$2,847	$231	$2,617	12.35
Residential Midstream	Residential	$7	$1	$6	6.68
Solar PV Market Rate	Solar	$24,154	$18,206	$5,948	1.33
Innovation - Market Rate	Residential	$0	$3	-$3	0.00
Total Portfolio Level	**Portfolio**	**$150,760**	**$77,601**	**$73,160**	**1.94**
Portfolio Level with EM&V and DOEE Oversight Costs	**Portfolio**	**$150,760**	**$79,411**	**$71,349**	**1.90**

Table 39 presents the results of Scenario #3. This scenario adjusts energy savings by incorporating both realization rates (from Scenario #2) and net-to-gross ratios. Eleven of the twelve program groups are cost-effective in this scenario. Both the benefits and costs are reduced in this scenario because no savings (or benefits) are assigned to free riders and the incremental measure costs associated with free riders are not included as an SCT cost (because they would have purchased the efficient equipment absent the program). The portfolio SCT ratio is slightly lower in Scenario #3 (1.84) than Scenario #2 (1.94), and the net benefits are significantly lower ($40.0 million vs. $73.2 million).

Table 39: Scenario #3 Net Verified Savings – SCT Results

Program	Sector	SCT Benefit ($1,000)	SCT Cost ($1,000)	SCT Net ($1,000)	SCT Ratio
C& I RX - Equipment Replacement/Small & Medium Business Rebates	Commercial	$7,258	$1,160	$6,098	6.26
Retrofit -Commercial Custom/Market Opp – Commercial Custom/New Construction - Commercial Custom/Pay for Performance	Commercial	$38,397	$20,210	$18,187	1.90
Market Transformation Value	Commercial	$443	$135	$308	3.28
Commercial Midstream - Lighting	Commercial	$11,513	$1,877	$9,636	6.13
Low Income MF Comprehensive	Residential	$7,012	$3,822	$3,190	1.83
Implementation Contractor DI/Income Qualified Efficiency Fund	Residential	$3,002	$2,569	$433	1.17
Low Income Prescriptive Rebate	Residential	$294	$111	$183	2.65
Retail Efficient Appliances	Residential	$6,455	$2,783	$3,672	2.32
Retail Lighting Food Bank	Residential	$2,847	$231	$2,617	12.35
Residential Midstream	Residential	$3	$1	$3	5.54
Solar PV Market Rate	Solar	$10,534	$8,194	$2,340	1.29
Innovation - Market Rate	Residential	$0	$3	-$3	0.00
Total Portfolio Level	**Portfolio**	**$87,758**	**$47,747**	**$40,011**	**1.84**
Portfolio Level with EM&V and DOEE Oversight Costs	**Portfolio**	**$87,758**	**$49,558**	**$38,201**	**1.77**

2.2.3 Cost-effectiveness Recommendations

The FY2021 cost-effectiveness analysis required the NMR team to thoroughly explore several of the energy, economic, and policy assumptions used by the DCSEU. Based on our review, we offer the following observations and recommendations:

- Although the DCSEU's calculation of SCT benefits and costs occurs in external workbooks, the mechanics of the DCSEU tracking system are expertly organized to facilitate benefit cost modeling. The application was well-documented and the DCSEU

staff was responsive to our inquiries. The tracking database details participation in all program measures and provides costs, benefits, energy use, and savings estimates.

- Since FY2017, the NMR team has suggested various improvements to the cost-effectiveness assumptions and calculations and DCSEU have adopted many of these. At the beginning of each year, we conduct a detailed review of DCSEU screening assumptions. The FY2022 review was more involved due to some of the policy changes in the new DCSEU contract.
- One input we recommend a careful review of for FY2022 is the avoided cost of generation capacity. The next four PJM capacity auctions (covering delivery years 2023/2024 to 2026/2027) will be held over the next two years, starting in June 2022. At minimum, these auction results should be reflected in the near-term avoided costs. However, the final clearing prices may also warrant a change to the long-term value for this component.
- DCSEU applies a cost adjustment that assumes participant costs are incurred a half year in the future. Conventional accounting calculates costs as if they are incurred in the present. Investments in energy efficiency are fundamentally an upfront capital investment today for energy savings realized over many years. This adjustment to the timing of cost occurrence by DCSEU should be omitted.
- The handling of dual baselines was well executed in the DCSEU tracking system. The most important dual baseline measure is LED lighting. The DCSEU savings assumptions for FY2021 assume implementation of the 2020 Energy Independence and Security Act (EISA) Phase II backstop. Energy savings from screw-based LED bulbs were assigned full savings for one year and then a significantly reduced annual savings value for the remainder of their useful life.
    - The residential lighting market is rapidly transforming to majority-LED sales and DOE recently released its final rulemaking establishing a 45 lumen/W baseline for virtually all screw-based lighting. Based on the timing and enforcement schedule of the federal standard, DCSEU's dual baseline assumption for FY2021 is sound.
    - For FY2022, we recommend that the DCSEU carefully review the measure life assumptions of any remaining residential LED measures with the NMR team and DOEE as early as possible because of the sensitivity of SCT results to this key input.
- Avoided CO2 emissions and other NEBs represent a significant share (56%) of the SCT benefits from FY2021 programs.
    - The DCSEU assumption of $100 per short ton value was based on the 2018 Avoided Energy Supply Cost (AESC) report. An updated 2021 AESC report uses a recommended carbon price of $128 per short ton (in 2021 dollars). The 2021 AESC report provides other options for the SCC – ranging from $92 to $493 – depending on the perspective used (abatement cost vs damages) and the region. For FY2022, DCSEU and DOEE have adopted the $128 per short ton assumption.

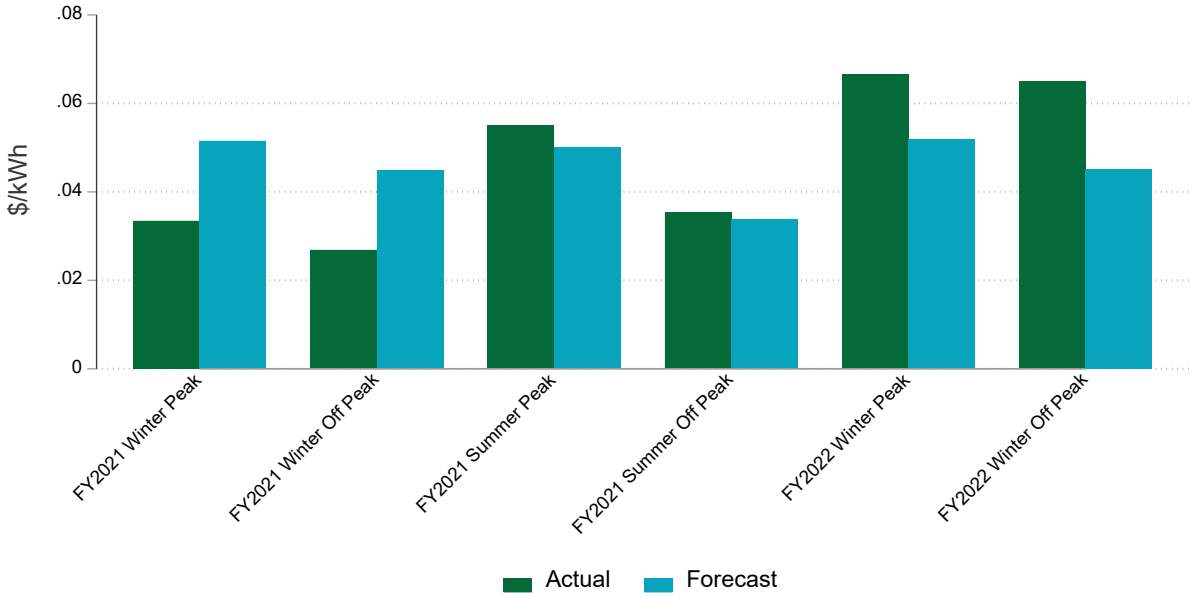
  - In October 2021, the AESC study was amended[39] to recommend a social cost of carbon of $393 per short ton. Massachusetts program administrators have adopted the $393 per short ton assumption in their 2022 – 2024 plan for energy efficiency and demand resources.

- To illustrate the sensitivity of the FY2021 cost-effectiveness results, the NMR team re-calculated the cost-effectiveness results with alternative assumptions for the value of avoided CO2 emissions.
  - Using the Massachusetts assumption of $393 per short ton, the Gross Verified Portfolio SCT ratio for FY2021 would be 4.29, over double the current ratio (1.94).
  - At $0 per short ton of CO2, but still including the 5% NEB and 15% low-income solar adders, Scenario #2 does remain cost-effective with a portfolio SCT ratio of 1.12. At $50 per short ton, while still including the NEB and low-income solar adders, the portfolio Level SCT ratio is 1.53 for Scenario #2. As shown in Table 38, the $100 per short ton assumption results in a portfolio SCT ratio of 1.94.
  - While the value of avoided CO2 assumption does not determine whether the FY2021 SETF portfolio is cost-effective, it does have a significant impact on the magnitude of the net benefits and SCT ratio. The $100 per short ton ($110.23 per metric ton) assumption for avoided CO2 emissions should be reviewed to ensure it is consistent with the District's policy objectives and other regional research on the value of reduced carbon emissions. The current federal social cost of carbon is approximately $46 per short ton ($51 per metric ton).

[39] See AESC_2021_Supplemental_Study-Update_to_Social Cost_of_Carbon_Recommendation.pdf (synapse-energy.com) for the updated recommendations and detailed discussion of SCC and relevant literature.

- The avoided cost of electricity forecast for FY2021 was developed from an analysis completed by the NMR team in 2017 that extends to 2050. As seen below in Figure 11, winter months of FY2021 had lower wholesale electric prices[40] than forecasted due to the COVID-19 pandemic and low fuel prices. Just one year later we see the opposite as war in Ukraine and other factors have increased fuel prices drastically. In general, we recommend not updating long-term forecasts based on short-term fluctuations. However, the avoided electricity forecast in place for FY2022 is lower than the FY2021 screening assumptions. If natural gas price futures look to remain elevated for several years, DOEE and DCSEU may wish to consider an update to the avoided cost of electricity and natural gas for FY2023.

Figure 11: Electric Energy Costs Over Time



- Beginning in FY2022, DCSEU will account for upstream emissions from natural gas extraction and processing in the SCT Test. This change raises the emissions rate of natural gas from 11.72 to 14.25 lbs. CO2/therm and raises the marginal emissions rate of electricity generation by approximately 11%. Scenario #1 for FY2021 is repeated with the inclusion of upstream emissions in Table 40. The result led to an additional 63,116 metric tons of avoided CO2 emissions and a slightly higher SCT ratio of 1.99.

[40] Load weighted real-time locational marginal pricing (LMP)s for PEPCO zone pulled from PJM's Data Miner 2 platform can be sourced here: https://dataminer2.pjm.com/feed/rt_fivemin_hrl_lmps/definition

Table 40: Modified Replica 1 with Upstream CO2 emissions – SCT Results

Program	Scenario #1 Modified Replica	Scenario #1 With Upstream Emissions
C& I RX - Equipment Replacement/Small & Medium Business Rebates	6.36	6.64
Retrofit/Market Opportunity/New Constriction/Pay for Perform -Commercial Custom	2.03	2.15
Market Transformation Value	3.04	3.17
Commercial Midstream - Lighting	5.93	6.20
Low-income Multifamily Comprehensive	1.84	1.92
Income Qualified Gas Efficiency Fund	1.16	1.24
Low Income Prescriptive Rebate	2.65	2.76
Retail Efficient Appliances/Heating and Cooling/Lighting/Seasonal Savings	2.44	2.53
Retail Lighting Food Bank/Home Energy Conservation Kit - Low-income	12.35	12.77
Residential Midstream	6.68	6.94
Solar PV Market Rate	1.33	1.38
Innovation - Market Rate	0.00	0.00
Total Portfolio Level	**2.12**	**2.23**
Total Portfolio Level with Administrative Cost	**1.93**	**2.04**
Portfolio Level with EM&V and DOEE Oversight Costs	**1.89**	**1.99**
Avoided CO2 Metric Tons	**568,140**	**631,256**

- The 5% adder for NEBs (other than CO2 emissions) is a proxy value to recognize tangible benefits that are challenging to directly quantify. The NMR team will continue to collaborate with DCSEU and DOEE to assess the appropriate value for the overall NEBs adder, the feasibility of supplemental health or low-income NEB adders, and the possibility of incorporating NEB research into our future evaluation activities.

A

Appendix A Program Descriptions

This appendix provides a description for each of the program tracks offered by DCSEU in FY2021.

A.1 Commercial Sector

7520CUST – Retrofit – Commercial Custom

The Custom Retrofit program offers incentives to owners of large buildings to install energy-efficient equipment or make operational changes to their facility that result in energy savings. The program focuses on retrofit projects where the equipment is being replaced prior to the end of its life. Incentives are offered for a variety of equipment types, including lighting, chillers, boilers, heat pumps, steam systems, insulation, refrigeration, and various building or equipment controls. Through this program, the DCSEU offers technical assistance to help decision makers design, scope, and fund their projects. Rebates are paid on a traditional per-unit of energy saved basis.

7520MARO – Market Opportunities – Commercial Custom

The Market Opportunity Custom program focuses on retrofit projects where equipment is at the end of its life. It offers incentives to large building owners who update equipment to energy-efficient options or update operational controls to achieve energy savings. This track includes measures in lighting, HVAC, and various commercial/residential appliances. Key objectives of the incentive are to offset the costs of adding energy-efficient equipment beyond the current energy code; provide comprehensive technical services to help decision makers design, scope, and fund their projects; and share the economic benefits with the customer. Funding is available through a traditional rebate structure where participants are paid per unit of energy saved.

7520NEWC – New Construction – Commercial Custom

This program focuses on construction of new buildings or facilities that exceed energy code standards. The New Construction Track covers a large range of new construction measures, including lighting; HVAC; building controls; building envelope elements, such as insulation and windows; and plug loads, such as icemakers, refrigerators, and freezers. DCSEU provides technical assistance in the design stage to help decision makers design, scope, and fund their projects. The key features of the incentive structure are to offset the incremental costs of adding more energy-efficient equipment than the current code requires, provide comprehensive technical services during design stage, and share the economic benefits with the customer.

7520P4PX – Pay for Performance

The P4P program launched in FY2019 to incentivize complex, multi-measure energy-efficiency projects that are not covered under existing program tracks. It focuses on existing commercial and industrial buildings, which implement multiple measures simultaneously or behavioral or operational changes where it is difficult to estimate savings. This may include re-/retro-commissioning, upgrades to the building controls, or fault detection. Incentives are paid based

on pre- and post- project metered data where actual energy saved is determined using multivariate linear regression of AMI (PEPCO) or monthly (WGL) meter data.

7511CIRX – C&I RX – Equipment Replacement

The Business Energy Rebate (BER) initiative provides small- to medium-sized businesses located in DC with a comprehensive set of services and financial incentives to help them transition to more energy-efficient equipment. The initiative provides prescriptive incentives for lighting, refrigeration, HVAC, compressed air, and food service and vending equipment. Rebates require written pre-approval and are given for facility improvements that result in a permanent reduction in electrical and/or natural gas energy usage persisting for a minimum of five years.

The initiative is implemented through individual contractors selected by the participant. The DCSEU Account Managers generate leads based on prior years' participation or interest. Customers can also call the DCSEU or visit the DCSEU website. Contractors are also trained on how to upsell energy-efficient equipment.

7511SMRX – Small & Medium Business Rebates

This track is for Small Businesses, under 10,000 square feet. The DCSEU has been offering higher incentives to them as part of an ongoing campaign. The measures offered are the same as 7511CIRX, but with slightly higher incentives.

7512MTV – Market Transformation Value

The T12 MTV initiative targets small- to medium-sized businesses (less than 10,000 square feet or less than 5,000 kWh/month). While larger customers can participate, they are encouraged to participate in an appropriate Custom track. MTV provides upgrades for old, inefficient equipment. The DCSEU staff interview applicants to determine incentive levels needed to move viable projects forward.

DCSEU staff and Certified Business Enterprise (CBE) contractors are responsible for outreach to potential participants. The CBE contractors install eligible equipment, and DCSEU staff inspect 100% of the projects prior to release of the financial incentive.

7513UPLT – Commercial Upstream

The Commercial Upstream/Midstream Lighting Program provides customers with point-of-purchase rebates when they buy qualified lighting products from participating distributors. Through this program, customers can receive rebates for ENERGY STAR 2.0 certified LED directional, omnidirectional, and decorative bulbs, as well as DLC certified linear LED tubes. This program format enables closer and more efficient tracking of product purchases. Distributors provide sales information directly to DCSEU, enabling higher levels of quality control. It also means that incentives can be adjusted more frequently "behind the scenes." In this way, the DCSEU can ensure that incentives more closely match changing conditions in the market. The DCSEU piloted this approach in FY2017 with lighting distributors.

A.2 SOLAR SECTOR

7101PVMR – Solar PV Market Rate

The PV Market Rate program provides incentives to buildings that install solar panels to reduce their consumption from the electric grid. The DCSEU works directly with contractors to identify potential properties. At the start of a project, the contractor submits project information (the Interconnection Application Agreement) to Pepco and the DCSEU. Pepco reviews the form and checks for completeness, determines circuit impact and operating conditions, and requests amendments to the contractor, as needed. Upon Pepco approval of this form, Pepco sends an "Approval to Install" notification to the contractor. Concurrently, the DCSEU checks the income qualification materials, scope of work, spec sheets, and other materials, and generates a work order. With Pepco's approval and a work order from DCSEU in hand, the contractor can begin installation. Once the project is completed, the DCSEU schedules an inspection with the contractor. As of FY2015, proof of interconnection from Pepco is required for DCSEU to issue payment to the contractor.

The program contributes to electricity savings, installed renewable energy capacity, the formation of green jobs, and low-income spending and savings. It also helps meet the DCSEU performance benchmark and address the needs of the solar market by serving as a low or no cost technical assistance center for solar installations.

A.3 LOW-INCOME SECTOR

4335IGEF – Income Qualified Gas Efficiency Fund

Washington Gas is partnering with the DCSEU to provide funding for natural gas efficiency upgrades for low- and limited-income residents of affordable multifamily housing in the District of Columbia. These projects consist of natural gas saving measures on old, inefficient equipment that can now be replaced with this available funding. These projects are classified as retrofits.

7610ICDI – Implementation Contractor Direct Install

The Low Income Multi Family (LIMF) Implementation Contractor Direct Install (ICDI) initiative provides specific services and products to LIMF community residents of the District of Columbia. The initiative is promoted to property owners, property managers, developers, architects, and engineers and is designed to serve a wide variety of energy efficiency needs. The ICDI initiative, initially launched as the Property Manager Direct Install (PMDI) initiative in April 2012, covers 100% of the costs (products and direct installation) and hires implementation contractors to perform the direct installation rather than having the property managers install the equipment.

7612LICP - Low-income Multifamily Comprehensive

The Low-income Multifamily Comprehensive program is designed to support low-income multifamily housing (specifically new construction or gut-rehab) in the installation of energy-efficient measures. The program allows DCSEU to provide technical expertise and funding. Each project is independently evaluated, and specific energy conservation measures (ECM) are chosen depending on the project's needs. Some of these ECMs will include measures affecting

the thermal envelope (air and thermal barriers, doors, and windows), domestic hot water systems, in-unit and common area lighting, appliances, and controls.

The initiatives work with developers and owners of low-income multifamily projects constructing, redeveloping, or rehabilitating affordable housing projects. The initiatives provide custom technical services and incentives for energy-efficiency improvements to low-income multifamily projects.

7610IQEF – Income Qualified Efficiency Fund

The Income Qualified Efficiency Fund program is designed to serve low-income multifamily housing, shelters, and approved clinics. Funding and priority are competitively awarded to approved contractors for energy-efficiency projects that generate significant energy savings and pass the associated financial benefits on to low-income DC residents. Efficiency measures that maximize energy savings, reach a large number of low-to-moderate income residents, and/or assist residents who face a loss of heating or air conditioning due to inoperable equipment receive priority. Supported measures include domestic hot water systems, lighting, appliances, controls, and measures improving the thermal envelope.

7613LIRX – Low-income Prescriptive Rebate

The Low-income Prescriptive Rebate program provides financial support for lighting installations in low-income multifamily housing and low-income shelters and clinics. Approved installations must be EnergyStar or DLC qualified. Projects tracked under 7613 LI RX are generally focused on specific end uses. 7613LIRX is focused on in-unit and common area lighting. The initiatives work with developers and owners of low-income multifamily projects who are constructing, redeveloping, or rehabilitating affordable housing projects. The initiatives provide custom technical services and incentives for energy-efficiency improvements to low-income multifamily projects.

7717FBNK – Retail Lighting Food Bank

The Food Bank Energy Efficient Lighting Distribution initiative provides LED lighting to low-income households in DC that receive goods from participating food banks. The DCSEU provides LEDs to these residents after verifying that their household is located in the District and conducting a short survey with the client to determine the appropriate number of bulbs needed.

7717HEKT – Home Energy Conservation Kit – Low-income

The Home Energy Conservation Kit – Low-income program sends energy conservation kits to low-income District residents. The only measures in this track are home energy conservation kits, which include an Advanced Power Strip, a Faucet Aerator, and six LEDs. They offer low-income DC residents a free, easy way to implement energy saving measures.

A.4 RESIDENTIAL SECTOR

7710APPL – Retail Efficient Appliances

The Retail Efficient Appliances program offers mail-in and online rebates for qualifying refrigerators, clothes washers, clothes dryers, heat pumps, air conditioners, boilers, furnaces, thermostats, and other products. Under this initiative, DCSEU partners with local retailers and contractors to promote these rebates, providing rebate forms in retail stores when possible.

7710LITE – Retail Lighting

The Retail Efficient Lighting program coordinates with lighting retailers and manufacturers to increase the availability of LEDs and offer them at lower prices for District residents and small businesses. This initiative works to educate customers on the benefit of LED lights and increase awareness as LEDs are less familiar to residents than CFLs or incandescent bulbs. Retailers and manufacturers are provided incentives on a per-bulb basis. The initiative is implemented by DCSEU with EFI providing support for incentive payment and data tracking. EFI is responsible for compiling and verifying manufacturer invoices and processing payments. Manufacturers submit invoices to EFI for payment and work with stores to gather sales reports that they submit along with the invoice requests.

7710HTCL – Retail Heating and Cooling

The Retail Heating and Cooling program works with contractors in the District to install heating and cooling equipment in residential applications. Measures include advanced and programmable thermostats (not smart thermostats), central air conditioners, domestic hot water heaters, boilers, furnaces, and ductless and air-source heat pumps. The only measure that does not require a contractor to install is a smart thermostat. Smart thermostats have their install verification through a confirmation with the manufacturer that the thermostat is connected to the internet and actively working.

7725RSUP – Residential Upstream

The Residential Upstream program is used to track residential, efficient lighting projects purchased through electrical distributors. Participating electrical distributors buy down the price of the lighting products and offer a point-of-sale rebate to their customers. After sale, they submit documentation to the DCSEU for reimbursement on the products.

A.5 SOLAR FOR ALL

7109LISF – Solar for All Low-income Single-family PV

Solar for All aims to provide low-income DC residents with the benefits of solar electricity. The program was established by the Renewable Portfolio Standard (RPS) act of 2016, which is funded by the Renewable Energy Development Fund (REDF). Upon enrolling in the Solar for All program, an installed system will offset the homeowner's electricity costs by about $500 per year or more. Renters who meet income requirements are eligible for the program if they agree to the terms and conditions. Once a homeowner is qualified, the system is installed at no cost and is fully funded by the DCSEU through the Solar for All program. The Solar for All program

operates on a first-come, first-served basis and fulfillment is dependent upon funding availability.

7108CREF – Solar for All Community Renewable PV

In addition to installing solar directly on income-qualified single-family homes, the DCSEU is also working with solar developers to install large community renewable energy facilities (CREFs), or community solar, on structures around the District as part of the Solar for All program. Once installed and operational, these systems can provide electricity bill credits to save income-qualified District residents up to 50% off their electricity bill each year. This allows residents who live in multifamily buildings or whose roofs are not suitable for solar to access savings from Solar for All.

Appendix B Detailed Program Recommendations

This section contains detailed program recommendations from the *DC Sustainable Energy Utility FY2021 Program Evaluation* report.

Our evaluation of the FY2021 programs found that DCSEU expended the appropriate amount of effort and rigor on their savings calculations. In general, the documentation provided was sufficient, and the methods and assumptions were suitable. The evaluation team believes the DCSEU calculated energy savings with a reasonable degree of accuracy.

However, our evaluation yielded specific recommendations for most programs, as described below. We offer two general types of recommendations: to improve the accuracy of savings calculations and to improve program design and delivery. Because most of the evaluation effort focuses on verifying the DCSEU tracked savings, the savings accuracy recommendations represent the majority of our recommendations. To more easily distinguish between the two types of recommendations, we have bolded and italicized the program design and delivery recommendations.

While DCSEU prescriptive savings estimates were reasonable in aggregate for the FY2021 programs, the NMR team believes the DCSEU can continue to improve calculation methods and should prioritize improvements that offer the most cost-effective outcomes. The NMR team provides one recommendation that applies to multiple programs.

- Apply project- specific efficiency levels, fixture wattages, peak summer coincident demand factors, and other inputs to improve the accuracy of tracked peak demand savings when feasible. DCSEU applied deemed load shapes from the TRM to the custom project calculations. In these cases, project-specific input values could be used, which would improve the accuracy of tracked peak demand savings. DCSEU should examine how integrating site-specific information within the tracking system can be done efficiently when these data are already collected from customers.

For the Custom Retrofit program, we offer the following recommendations:

- Six of the 31 sampled projects were not retrofits or equipment replacements; rather, they were new construction or gut rehab projects. Consider including all new construction projects (i.e., those with theoretical baselines based on building energy code) in the Commercial New Construction program.
- Include a narrative within each project that describes the approach to estimating energy savings for all measures. Provide references to relevant spreadsheets and external sources of inputs for savings calculations.
- Consider adding a separate load shape peak demand value for air conditioning systems in school facilities. The “Commercial A/C” value is not appropriate for schools, which typically have limited operation over the summer (i.e., during most of the peak coincident period).

For the Commercial New Construction program, we offer the following recommendations:

- The NMR team recommends that SEU change their approach to estimating peak coincident demand savings for projects for which a building simulation model was developed. The outputs from most building simulation software includes only total load reduction by end-use category. SEU then typically applies the "Commercial A/C" load shape value for peak coincident demand to calculate peak demand savings. The NMR team recommends determining a project-specific load shape (or coincidence factor) value for each project, based on the actual operating conditions of the facility.
- If TRM deemed load shape values are used to calculate peak demand savings, ensure that each measure involved in the project is assigned the most appropriate load shape value.

For the Market Opportunities program, we offer the following recommendations:

- Utilize Typical Meteorological Year weather data to weather-normalize the energy consumption of weather-dependent systems and measures in custom analyses.
- Ensure that all building systems that use electricity during the peak period (2:00 – 6:00 p.m. on non-holiday weekdays between June and August) are included in estimates of peak coincident demand savings for projects. Such systems typically include interior lighting, space cooling, heat rejection, and ventilation.
- ***Consider ways to make the application process more user-friendly and guide the customer through the steps of application submission and approval.*** *This participant reported difficulties with the application and thought the amount of the rebate did not justify the level of effort required.*

For the CIRX Equipment Replacement program, we offer the following recommendations:

- Project files should include a lighting specification sheet and/or certification (DLC or Energy Star) listing for every unique installed fixture type. Each specification sheet or certification listing should show the manufacturer, model number, fixture wattage and lumen output.
- Consider requiring program applicants to provide a full list of spaces within the facility that were affected by the project.

For the Commercial Upstream Lighting program, we offer the following recommendations:

- Project files should include a specification sheet and/or certification (DLC or Energy Star) listing for every unique installed fixture type. Each specification sheet or certification listing should show the manufacturer, model number, fixture wattage, and lumen output.
- Consider requiring distributors to collect additional site-specific information at the time of sale, to be used in the energy savings calculations for each project. This should help in calculating more accurate energy consumption and savings estimates at the project level. Examples of additional inputs could include baseline fixture types and wattages, schedules (and associated hours of use and peak coincidence factor), heating fuel type, and facility and space type(s).

- Similarly, consider requiring distributors to collect contact information for the purchaser at the time of sale. Not only could it provide an opportunity for DCSEU to market additional savings opportunities to new commercial customers, but it would also improve the quality of the evaluation. The NMR team could only contact Commercial Upstream Lighting participants who had contact information on file from participating in another DCSEU program, which biases the study results towards more highly engaged participants.

For the Pay for Performance program, we offer the following recommendations:

- Continue to leverage the existing modeling scripts and data analytics processes for the P4P program. The modeling continues to be robust, accurate and consistent with data science best practices.
- When accounting for anomalous events in the baseline or efficient time periods, ensure that the effects of these anomalous events are removed from all fuel savings including energy (kWh), demand (kW), and natural gas (MMBTU).

For the Solar PV Market Rate program, we offer the following recommendations:

- Peak demand savings should be calculated as the average load savings during peak period hours (2:00 – 6:00 p.m. on non-holiday weekdays between June and August). Provide the 8,760-hour spreadsheet output from the PV Watts tool that was used for ex ante savings.
- Ensure the proper module type is selected for each project in PV Watts, based on the efficiencies of the installed equipment.

For the Low-Income Multifamily Comprehensive program, we offer the following recommendations:

- Ensure that savings calculations are based on the appropriate hours of use and waste heat factors given the building heating fuel types and rooms in which lighting was installed.
- Ensure that any savings inputs used in calculations match those listed on supporting documentation.
- Review post-installation photos to ensure that savings inputs are derived from the appliance models installed.
- Review procedures for faucet aerator and ceiling exhaust fan peak demand calculations to ensure they are consistent across measures.

For the Income Qualified Efficiency Fund program, we offer the following recommendation:

- Ensure that savings inputs used in calculations match those listed in supporting documentation.

For the Retail Heating & Cooling program we offer the following recommendations based on feedback from participant surveys:

- ***Consider increasing the rebate amount for eligible equipment types where feasible.*** *When asked to suggest any changes DCSEU could make to the program, survey respondents most commonly cited increasing the rebate amount.*
- ***Identify opportunities to simplify the application process, in particular the paperwork that participants need to complete.*** *Although most participants were generally satisfied with the application process, some survey respondents reported that the application process was too lengthy and burdensome.*

For the Retail Efficient Appliances program, we offer the following recommendations based on feedback from participant surveys:

- ***Consider increasing the rebate amount and expanding the types of eligible equipment where feasible****. When asked to suggest any changes DCSEU could make to the program, survey respondents most commonly cited increasing the rebate amount and the variety of eligible equipment.*
- ***Continue to offer education about savings from energy-efficient appliances so customers are prepared to choose an energy-efficient model when their current equipment fails.*** *Survey respondents rated energy efficiency and reduced energy bills as non-programmatic factors that exhibited little influence on their purchasing decision relative to more important factors such as product features and product reviews. Consequently, there appears to be an opportunity for DCSEU to increase awareness concerning the benefits of selecting energy-efficient models.*

Appendix C Solar For All Cost Effectiveness Results

This appendix presents results for two Solar For All (SFA) programs that the DCSEU tracks performance for but that are not funded through the core Sustainable Energy Trust Fund (SETF) or leveraged funds. The two programs are Solar for All Community Renewable PV Energy and Solar for All Low-income Single-family PV. These programs seek to provide disadvantaged DC communities with access to affordable renewable energy.

The Low-Income Single Family (LISF) program allows low-income residents access to the energy and money saving benefits of solar energy. Participants receive a credit back on their monthly electricity bill. In FY2021, the LISF program provided incentives for 122 projects and claimed 0.51 MW of generation capacity.

The Community Renewable Energy Facility (CREF) initiative strives to deliver sustainable energy services to residential, commercial, and industrial institutions. Community solar provides the benefits of solar technology to residents who traditionally would not be able to take advantage of solar power, such as renters, residents in multifamily buildings, or those with rooftops that need repairs. In FY2021, the CREF program claimed 5.00 MW of generation capacity.

Table 41 shows the SCT results for each scenario, which is similar to Table 33 in the main section of the report. Both programs have SCT ratios well above 1.0. The main difference between the Modified Replica and the Gross and Net Verified Savings is the inclusion of avoided costs from complying with the DC Renewable Portfolio Standard (RPS)[41]. The addition of RPS leads to a higher SCT ratio across the entire solar portfolio. Note that the realization rates for both programs are above 100%, so the SCT ratio in Scenario #2 is higher than in Scenario #1. In addition, Scenario #3 is exactly the same as Scenario #2 because the NTG ratio is 100% for both programs.

[41] This is because each MWh of solar energy (electric or thermal) qualifies as one SREC, which can be traded on the DC SREC market to satisfy renewable energy generation requirements of the DC Renewable Portfolio Standard (RPS). Electricity suppliers must acquire, on an annual basis, the appropriate number of SRECs as required by the RPS or make Solar Alternative Compliance Payments (SACP) for any SREC not acquired. The SACP price is set at $500 through 2023, or $0.50 per kWh. It is reasonable to assume that every SREC created eliminates the need for one SACP purchase. Therefore, the avoided costs attributable to renewable measures will include the value of the SREC creation (the difference between SACP price and SREC price), which will be added to the standard avoided costs. The latest year's average SREC trading price for the DC market is used to establish the SREC value for the subsequent program year. For FY2021, the weighted average SREC price from November 26, 2018, through November 18, 2019 ($390.41 per MWh, or $0.39 per kWh) is used as a basis to calculate the value of avoided compliance payments. In 2024, the SACP begins an annual decline and therefore the SREC price is taken to be 78.08% of the SACP (ratio of $390.41 to $500.00) until the RPS expires at the end of 2032. Beginning in 2033, this additional benefit stream drops to zero.

Table 41: Cost Test Ratios by Scenario – SFA Programs

Program	Modified Replica Scenario #1	Gross Verified Savings Scenario #2	Net Verified Savings Scenario #3
Solar for All Community Renewable PV Energy	1.39	1.39	1.39
Solar for All Low-income Single-family PV	1.72	2.04	2.04
Total Portfolio Level	**1.30**	**1.33**	**1.33**
Portfolio Level with EM&V and DOEE Oversight Costs	**1.26**	**1.29**	**1.29**

Table 42 shows the costs for the SFA programs, which is similar to Table 34. In Parameter E, we assume that the SFA programs do not account for any additional portfolio costs. The value for Parameter H – $0.7 million – represents an estimate of the DOEE oversight costs dedicated to SFA programs. All NMR EM&V costs are assigned to the SETF portfolio, and none are assigned to the SFA programs. The total SCT costs without oversight and EM&V are roughly $25 million, compared with $80.1 million in SCT costs for the core SETF programs.

Table 42: FY2021 Cost Summary – SFA Programs

Parameter	Cost Component	FY2021 Portfolio Total
A	Incentive Payments	$8,207,595
B	Participant Cost (Net of Incentives)	$14,611,260
C	Incremental Measure Cost (A + B)	$22,818,855
D	Track-specific Administrative Costs (Non-incentive)	$0
E	Portfolio Administrative Costs	$2,073,999
F	Total Program Administration Cost (D+E)	$2,073,999
G	**Total SCT Costs (C+F)**	**$24,892,854**
H	DOEE Oversight and NMR EM&V Costs	$666,991
I	**Total SCT Costs with Oversight and EM&V (C+F+H)**	**$25,559,845**

The avoided cost assumptions for the SFA programs are the same as shown in Table 36. Table 43 shows the lifetime avoided CO2 emissions associated with the SFA programs (similar to Table 35 in the main report). Avoided CO2 emissions are approximately 97,000 metric tons for the SFA programs compared to 568,140 for the core SETF programs.

Table 43: Lifetime CO2 Emission Reductions – FY2021 Programs

Scenario	Lifetime Avoided CO2 Emissions (Metric Tons)
1 – Modified Replica	96,566
2 – Gross Verified Savings	99,755
3 – Net Verified Savings	99,755

Table 44 shows detailed SCT results for Scenario #1 and Table 45 shows detailed results for Scenarios #2 and #3. Because the realization rate is slightly above 100% and the NTG ratio is assumed to be 100%, the results are similar for all three scenarios.

Table 44: Scenario #1 Modified Replica – SCT Results

Program	Sector	SCT Benefit ($1,000)	SCT Cost ($1,000)	SCT Net ($1,000)	SCT Ratio
Solar for All Community Renewable PV Energy	Solar For All	$29,236	$21,071	$8,165	1.39
Solar for All Low-income Single-family PV	Solar For All	$3,074	$1,782	$1,292	1.72
Total Portfolio Level	**SFA Portfolio**	**$32,310**	**$24,928**	**$7,382**	**1.30**
Portfolio Level with EM&V and DOEE Oversight Costs	**SFA Portfolio**	**$32,310**	**$25,595**	**$6,715**	**1.26**

Table 45: Scenarios #2 and #3 Gross and Net Verified Savings – SCT Results

Program	Sector	SCT Benefit ($1,000)	SCT Cost ($1,000)	SCT Net ($1,000)	SCT Ratio
Solar for All Community Renewable PV Energy	Solar For All	$29,393	$21,071	$8,322	1.39
Solar for All Low-income Single-family PV	Solar For All	$3,639	$1,782	$1,857	2.04
Total Portfolio Level	**SFA Portfolio**	**$33,033**	**$24,928**	**$8,105**	**1.33**
Portfolio Level with EM&V and DOEE Oversight Costs	**SFA Portfolio**	**$33,033**	**$25,595**	**$7,438**	**1.29**