OPC

OFFICE OF PEOPLE'S COUNSEL

State of Maryland

EmPOWER Maryland: 2022 Performance and Recommendations for Improvement

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Prepared by

veic

In 2022, EmPOWER programs generated more than $900 million in benefits. Even greater opportunities lie ahead.

These comments reflect VEIC's evaluation of the EmPOWER Maryland programs, made on behalf of the Maryland Office of People's Counsel (OPC) and based on the Q3-Q4 2022 Semi-Annual reports submitted by the six EmPOWER utilities[1] and the Department of Housing and Community Development. Building on many years of reviewing Semi-Annual reports for OPC, VEIC's comments indicate areas of strengths and weaknesses across programs and across utilities.

In recognition of the current focus on developing plans for the 2024-2026 cycle, the comments put evaluation of programs in the context of opportunities and priorities for the next cycle.

[1] "EmPOWER utilities" refers to The Potomac Edison Company ("Potomac Edison" or "Potomac"), Baltimore Gas and Electric Company ("Baltimore Gas & Electric" or "BGE"), Delmarva Power & Light Company ("Delmarva" or "DPL"), Potomac Electric Power Company ("Pepco"), and the Southern Maryland Electric Cooperative, Inc. ("SMECO") –jointly referred to as the "EmPOWER electric utilities")–and one gas utility, Washington Gas Light Company ("WGL" or "Washington Gas").

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Executive Summary

These comments reflect VEIC's evaluation of the EmPOWER Maryland programs, made on behalf of the Maryland Office of People's Counsel (OPC) and based on the Q3-Q4 2022 Semi-Annual reports submitted by the six EmPOWER utilities and DHCD. Building on many years of reviewing Semi-Annual reports for OPC, VEIC comments indicate areas of strengths and weaknesses across programs and across utilities. In recognition of the current focus on developing plans for the 2024-2026 cycle, the comments put evaluation of programs in the context of opportunities and priorities for the next cycle.

In response to several Commission orders and more than a year of stakeholder involvement through the Future Programing Work Group, EmPOWER is in the process of evolving to provide additional benefits and greater alignment with state policy objectives, including reduction of greenhouse gas (GHG) emissions consistent with the Climate Solutions Now Act. Recent analysis has also highlighted the fact that EmPOWER is not meeting even minimal standards for equity, with limited income households receiving less program spending than they pay in the EmPOWER surcharge. True equity would *start* with limited-income households receiving benefits commensurate with their share of the population.

EmPOWER's evolution will build on a strong foundation of success. In the cycle-to-date (CTD), EmPOWER programs delivered electricity savings at a cost of 3.3 cents/kilowatt-hour, which is approximately half the cost of electricity in Maryland. The combined lifetime benefits of EmPOWER programs in 2022 was nearly $1 billion, contributing to the more than $13 billion in benefits since its inception. Although EmPOWER is producing meaningful GHG reductions (1.6 million metric tons from residential programs CTD), the EmPOWER GHG Abatement Potential Study found that 45% of residential GHG potential would come from beneficial electrification, which is largely absent from EmPOWER today.

As plans are laid for the next cycle, EmPOWER can and must evolve in four fundamental ways:

1. The depth and breadth of savings must increase with more ambitious program designs and strategies;
2. As a whole, programs must deliver substantially greater savings to limited-income households, through increased budgets for DHCD and greater support from the utilities, both of which are needed to reach many more eligible participants;
3. Beneficial electrification must become embedded in most program areas, with a focus on heat pumps for space and water heating; and
4. Programs and technologies need an increased focus on managing *when* energy is used, which goes well beyond reducing peak demand on the hottest days of the summer.

At the residential portfolio level, all electric utilities continue to save more electricity than they forecast while spending less than they budgeted. This overall performance reminds us that the utilities' projections of possible savings, and their budget estimates, have been consistently conservative.

Neither gas utility is meeting its savings forecast, however. Baltimore Gas & Electric achieved only 33% of forecasted gas savings for this CTD. Approximately half of the savings claimed by Washington Gas is coming from replacement of gas appliances with new gas-burning appliances with incrementally higher efficiency, and especially from the installation of gas appliances in newly constructed homes. Unless retrofitted before the end of their useful life, most of these gas appliances will remain in place well past 2031, by which time Maryland has committed to reduce GHG by 60%. Each year Maryland continues to use utility customer funding to provide incentives for installation of gas equipment makes it more difficult and more costly to achieve necessary GHG reductions.

No utility is achieving its forecasted savings in all program areas, but SMECO is coming close, with its lowest performing program (Residential Retrofit) at approximately 75% for the CTD.

With the exception of SMECO, the other utilities are again performing universally poorly in their HVAC programs. On an aggregated basis, the electric utilities are achieving only half of the forecasted savings. This is the fourth set of consecutive semi-annual comments in which we have emphasized the performance issues with the HVAC program and its midstream program design. This program should be the foundation of a building electrification strategy. After more than a year of meetings of the Midstream Work Group, it has become clear that progress toward more effective program design and streamlined implementation will only be possible under a single implementer. We encourage the utilities to adopt this approach in their plans and the Commission to order it if necessary.

New analysis of limited-income participation in DHCD and utility programs indicates that limited-income households are participating in utility retrofit programs in far greater numbers than in the DHCD programs for which they are eligible—programs which provide greater savings at no cost to the participant. We recommend that the Commission assign the utilities goals around limited-income participation in DHCD programs, so they have increased incentive to help DHCD programs reach participants and less incentive to promote their own retrofit programs to limited-income households. We identify numerous utility programs—such as the Behavior program—with greater potential to increase participation in DHCD programs.

For the first time this semi-annual report includes reliable and transparent estimates of the GHG reductions from EmPOWER programs, produced by the Commission's independent evaluator. EmPOWER programs in 2022 produced 1.77 million metric tons of GHG reduction on a gross lifecycle basis, with 0.76 million of those tons coming from residential programs. Across EmPOWER (including DHCD), the residential share of GHG reductions (44%) is proportional to the share of residential electricity sales; however, utilities' proportions of residential savings vary significantly. Only 30% or less of Potomac Edison and Delmarva's GHG reductions came from residential programs. Utility GHG reductions also vary widely in the proportion of savings to the size of their electricity sales, with Delmarva and Pepco achieving 50-100% more GHG savings as a function of sales than Potomac Edison or BGE.

Definitions

Annual savings refers to the savings achieved in the first year after it is installed or otherwise paid for. Annual savings can be used to measure greenhouse gases reductions or energy savings, in this report we only use it for the latter.

Lifecycle savings/reductions refers to the energy savings or greenhouse gas reductions achieved throughout the expected life of the measure, taking into account projected changes over time (e.g., avoided emissions from future electricity savings will be lower). When lifetime savings are put in monetary terms, projected future energy costs are used and everything is discounted to present value dollars.

Gross savings refers to the total savings (either annual or lifecycle) from measures promoted by EmPOWER programs, without consideration to whether the measures might have been installed or pursued absent the program.

Net savings refers to the estimated savings (either annual or lifecycle) from measures promoted by EmPOWER programs that are *attributed* to the program and deemed to have not occurred absent the program.

Cycle to Date (CTD) refers to totals since the start of the three-year cycle, e.g., 2021. When reported savings (or spending or participation) are compared to *forecasts* on a CTD basis, the forecasts are also pro-rated for the proportion of the cycle elapsed.

Program Year: In reference to full-year totals

Acronyms

AMI: Area Median Income or Advanced Metering Infrastructure
ASHP: Air-source heat pump
BGE: Baltimore Gas and Electric Company
BTU: British Thermal Unit
CAC: Central air conditioner
DHCD: Department of Housing and Community Development (Maryland)
DPL: Delmarva Power & Light Company
DR: Demand Response
ESRPP: ENERGY STAR Retail Products Platform
GHG: Greenhouse gas
HEIP: Home Energy Improvement Program (SMECO only)
HER: Home Energy Report
HPWH: Heat pump water heater
HPwES: Home Performance with EnergyStar
HVAC: Heating, ventilation and air conditioning
IRA: Inflation Reduction Act (U.S.)
KWh: Kilowatt-hour
LED: Light emitting diode
MEA: Maryland Energy Administration
MEEHA: Multifamily Energy Efficiency and Housing Affordability Program (DHCD only)
MEET: Maryland Energy Efficiency Tune-Up (DHCD only)
ML: MailLog. This is a reference to a filed document identifier on the Maryland Public Service Commission's website.[2]
MMBTU: Million BTU
MWh: Megawatt-hour (1,000 kilowatt-hours)
OHEP: Office of Home Energy Programs (Maryland)
QHEC: Quick Home Energy Check-up
SMECO: Southern Maryland Electric Cooperative, Inc.
WGL: Washington Gas Light Company
ZERH: Zero Energy Ready Homes

[2] Filed documents can be searched by MailLog number through this page: **https://webpsc.psc.state.md.us/DMS/maillogsearch**

EmPOWER Program Descriptions

Each EmPOWER program is designed to target specific technologies, customers, or both. Programs focus on different decision-points related to energy use and equipment purchase. For example, some programs target customers who are shopping in a store (or online) for a new appliance and others seek to engage and motivate them when they are at home reviewing their energy bills. Other programs target the contractors and suppliers who influence customer choices about equipment installed for them (e.g. a new heating system).

Lighting

The EmPOWER Retail Lighting programs provide instant discounts for light-emitting diode (LED) products sold via retail channels, pop-up lighting events, online marketplaces and through partnerships with Maryland food banks targeting limited income customers. In 2022 federal standards for general service lighting increased to levels effectively transforming residential lighting to high efficiency LED technology. As such, absent new program strategies, the 2022 program year will be the final full year of traditional retail lighting programs for EmPOWER utilities.

Appliance Rebate

The Appliance Rebate programs offer instant, online, and paper rebates for select ENERGY STAR products, including room air conditioners, dehumidifiers, room air purifiers, heat pump water heaters, refrigerators, freezers, clothes washers, clothes dryers, pool pumps, advanced power strips, and smart thermostats.

The EmPOWER electric utilities deliver Appliance program rebates through separate "downstream" and "midstream" channels, which seek to influence equipment purchases in different ways. The suite of eligible measures varies from utility to utility except for those offerings delivered through the ENERGY STAR® Retail Products Platform (ESRPP), which is a midstream channel. The traditional downstream offerings involve individual customer applications, whereas the midstream point-of-sale offerings are delivered through instant coupon rebates, instant markdown, or a midstream retailer incentive (i.e., the ESRPP) with participating retailers. All five electric utilities also offer a midstream heat pump water heater initiative offering incentives through participating distributors, which typically sell equipment to contractors not end-use customers.

Appliance Recycling

The Appliance Recycling program encourages the early retirement and recycling of inefficient operating appliances by offering customers a rebate and free appliance pick-up. The program primarily targets recycling of refrigerators and freezers, but also offers ancillary pick-ups for room air conditioners and dehumidifiers in addition to local community turn-in events.

HVAC

The HVAC program promotes efficient heating and cooling technology for homes, including efficient air conditioners, heat pumps, and furnace technology, along with smart thermostats installed with HVAC measures. For most HVAC equipment, contractors and distributors are highly influential about the choice of equipment that customers have effective access to, whether due to stocking, installer knowledge, or other factors. Starting in 2018, HVAC programs largely transitioned to a midstream channel model, which targets incentives and engagement at equipment distributors and installation contractors. Although some residential retrofit projects include HVAC measures, the HVAC Program is the primary EmPOWER program for influencing replacement of heating and cooling equipment.

Smart Thermostats

EmPOWER utilities achieve savings through the installation of advanced ("smart") thermostats with features that include seasonal or daily setpoint optimization. This product class provides some level of baseline structural efficiency while also providing demand response potential. (Demand Response programs are reviewed separately.) There are multiple programs through which customers can purchase or install smart thermostats. In addition, all of the electric utilities except for Potomac Edison also run a separate program generally described as "Thermostat Optimization". As a result, smart thermostats are used in multiple ways across the EmPOWER portfolio. Part of the purpose of this review is to examine those multiple channels and the degree of coordination among them.

Residential Retrofit

The Residential Retrofit program group includes Quick Home Energy Check-up (QHEC), Home Performance with Energy Star (HPwES) and SMECO's Home Energy Improvement Program (HEIP) which combines elements of the two other programs offered by the other electric utilities. Washington Gas supports residential retrofits through its Coordinated Program, through which WGL and electric utilities share costs and savings in homes with electric and gas savings. The residential retrofit programs are distinct from most other EmPOWER programs in that they employ a "whole home" (vs. technology specific) approach.

QHEC

QHEC (and HEIP) include an initial walk-through where a certified technician inspects the condition of a home, identifies opportunities for savings, and offers the direct installation of smaller measures that provide immediate savings, such as smart power strips or efficient flow showerheads. QHEC is free to EmPOWER ratepayers.

HPwES & HEIP

HPwES begins with a more comprehensive energy audit – including a blower door test, for example - to identify energy savings opportunities. Direct installation measures are also offered. Audit results point participants to performance-based rebates for air sealing and insulation, heating and cooling equipment, and other weatherization measures. Participants in need of financing may be directed to the Maryland Clean Energy Advantage Loan Program.

New Construction

The EmPOWER incentive program for residential new construction is based on the national ENERGY STAR® program and is referred to by the utilities as ENERGY STAR for New Homes. The basic program and incentive structure target whole home energy performance. Homes that earn the ENERGY STAR label are estimated to be at least 10% more energy efficient than the prevailing energy code and are backed by established national quality standards. In the current program cycle, utilities have begun offering specific incentives for additional measures (high efficiency heating, cooling, and water heating equipment), as well as an option to certify to U.S. DOE's Zero Energy Ready Homes (ZERH).

Energy Efficiency Kits

Potomac Edison and SMECO offer energy efficiency kits sent through the mail to customers. The kits contain basic energy efficiency measures, such as LED bulbs, that customers can install themselves to reduce energy consumption. The kits may be offered to customers opening new utility accounts, upon request, or other circumstances. DHCD started a kits-based program in 2022, targeting limited income households. As residential LED bulbs are phased out, the energy savings from kits will need to diversity.

Behavior

The EmPOWER Behavior programs save energy by providing insights to customers through printed and emailed home energy reports (HERs), digital tools, and messaging to customers. These tools leverage advanced meter infrastructure (AMI) data to influence energy saving behavioral changes by customers (compared statistically to non-targeted customers). Energy savings accrue as end-users adopt behaviors recommended in the reports based on usage patterns and historical trends. In EmPOWER, savings from behavior programs are assumed to last for a single year.

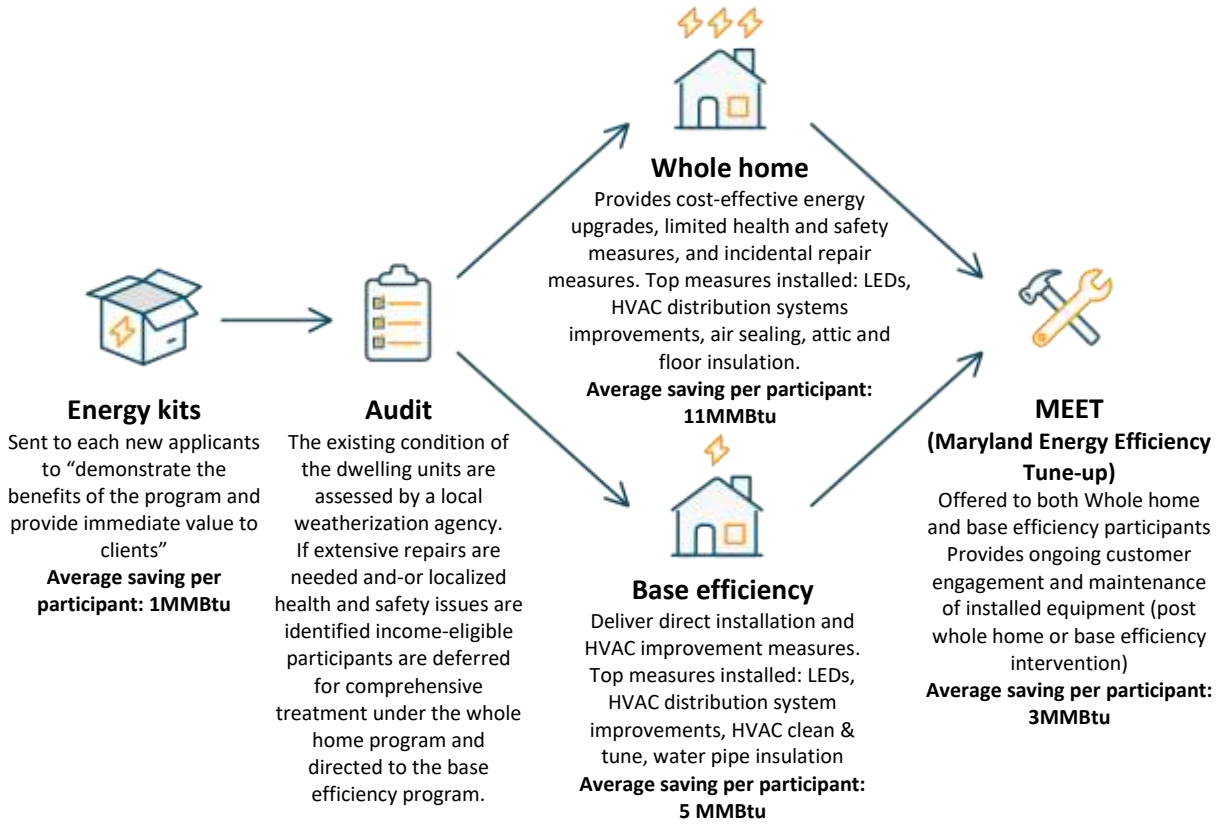
Behavioral programs utilize social norms and feedback to achieve energy reductions through behavior modifications. Many programs offer advice to improve energy consumption, though programs continue to evolve to target specific behaviors relevant to the end user such as no- or low-cost actions, seasonal tips, cross-promotional messaging, or disaggregated insights. Generally, behavioral programs result in habitual curtailment or small efficiency upgrades (such as lightbulbs). Savings tend to be largest in the summer and winter when space conditioning appliances are most heavily relied on. Behavioral programs may also recommend participation in other utility programs, though this spillover represents a small fraction of overall program savings and are not accrued in behavioral program totals.[3]

Limited Income

The Maryland Department of Housing and Community Development (DHCD) programs serve both single family and multifamily markets. Eligible customers have household incomes less than 250% of the Federal Poverty Level. Although participation in DHCD programs has no

[3] Allcott, Hunt, and Todd Rogers. 2014. "The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation." American Economic Review, 104 (10): 3003-37.

direct cost to participants, identifying eligible customers and engaging and supporting them to participate in programs is an enormous and complex task. For the single-family segment, a comprehensive suite of programs targets customers at different stages of their journey toward energy efficiency, based on specific barriers to participation.



Marylanders in the multifamily market are eligible to receive an energy kit. DHCD also runs the Multifamily Energy Efficiency and Housing Affordability Program (MEEHA) to generate deep energy savings in building that are home to a minimum of 20% of households at 80% of the average median income (AMI) or less[4].

Demand Response

With the exception of Potomac Edison, the EmPOWER electric utilities offer customers and members a variety of options to encourage participation in Demand Response (DR) programs, increasingly referred to broadly as "demand flexibility". These programs use a variety of technologies, equipment, and behavioral/economic incentive strategies to encourage changes in residential load at critical or strategic peak moments on the grid to

[4] https://dhcd.maryland.gov/HousingDevelopment/Pages/EnergyEfficiencyWeatherization.aspx

offset costs. They help demand follow supply rather than the other way around, which can be highly cost-effective.

There are two broad approaches to DR programs: direct load control (DLC) through smart devices (in exchange for financial incentives) and behavioral DR which send customers information and price signals to encourage demand reduction. A general trend in DLC programs is a Bring Your Own Device (BYOD) approach that allows customers to opt in using any eligible device (e.g., smart thermostat) from multiple manufacturers.

Demand Response differs somewhat from energy efficiency offerings because there is inherent economic value in the *potential* to reduce demand, even if the need does not arise in any given time. The PJM Independent System Operator has strict guidelines on what can be counted as realistic DR potential. For that reason, for DR, both the forecasted and reported "savings" in summary tables reflect potential demand reduction, not actuals.

Benefits of EmPOWER

Energy efficiency continues to be a "least-cost resource" for the electric utility system. This means the more energy efficiency that is acquired, the less of more expensive resources consumers need to purchase—e.g., generated power. The cost to acquire a kilowatt-hour (kWh) of savings through EmPOWER for the cycle-to-date (CTD) ranges from 2.6 - 4.7 cents, significantly lower than purchased electricity, which ranges from 6.5 – 8.3 cents per kWh under Maryland's Standard Offer Service program.[5] Much of the savings from EmPOWER programs offered in a given year last well into future years.

Table 1: CTD energy and cost savings—all EmPOWER electric utility programs.

Utility	Reported Program Expenditures ($)	Reported Lifecycle Savings (MWh)	Cost per Lifecycle Savings (c/kWh)
POTOMAC	63,394,075	2,422,266	2.6
BGE	265,960,403	7,562,215	3.5
PEPCO	165,337,201	5,574,925	3.0
DPL	52,052,635	1,573,354	3.3
SMECO	49,251,486	1,050,005	4.7

Energy efficiency investments deliver myriad economic benefits to the electric system, such as avoided capital investments in peak generation capacity, avoided investments in transmission and distribution infrastructure, reduced line losses, and avoided reserves. These savings accrue to all ratepayers—regardless of whether they directly participate in EmPOWER

[5] The weighted average Standard Offer Service (SOS) price from October 1, 2021 to May 31, 2022 for the participating electric utilities ranges from $0.0653 to $0.0833 per kWh, based on the data available at **https://www.psc.state.md.us/electricity/standard-offer-service/**.

programs. Although less pronounced than with electricity, reduced use of natural gas also has some broader utility system benefits.[6]

Of course, in addition to all the system-wide benefits, Marylanders who participate in EmPOWER energy efficiency and demand response programs receive a variety of direct benefits, such as reduced energy bills, reduced operation and maintenance costs, improved health, and increased comfort.

The Primary Maryland Jurisdiction-Specific Test puts benefits and costs in monetary terms using available data and best practices for measurement and evaluation.

Beyond the direct benefits to ratepayers and program participants, EmPOWER programs result in societal benefits. EmPOWER can and must be utilized to help Maryland achieve the greenhouse gas reduction targets in the Climate Solutions Now Act of 2022. It also can provide improved air quality, reduced energy burdens for low-income customers, jobs and workforce development benefits, and increased energy security and resilience.

EmPOWER benefits and costs are measured using a primary cost-effectiveness test, approved by the Commission, called the Primary Maryland Jurisdiction-Specific Test. This test was recently updated (and renamed) with input from stakeholders and approval from the Commission. The test cannot measure all costs and benefits, but it provides a robust tool for evaluating EmPOWER programs, plans, and investments.

Since EmPOWER's inception, the program has generated more than $13 billion in lifetime savings.

In 2022, EmPOWER generated nearly $1 billion in lifetime benefits, contributing to the more than $13 billion from EmPOWER since its inception.

Given the number and diversity of benefits provided by EmPOWER, it may be helpful to think of EmPOWER as a *platform* that supports customer engagement in behind-the-meter investments with system and societal benefits and evolves even as technologies and policy objectives continue to evolve.

[6] Both gas and electricity utility systems must be sized and built to meet peak demand conditions and in the long-run, lower peak demand reduces system costs. However, electricity supply costs are also highly sensitive to peak demand reductions in the short term.

Opportunities for EmPOWER

EmPOWER is at an important crossroads, with the opportunity—and imperative—to deliver greater savings and contribute more directly to Maryland's greenhouse gas reduction and equity objectives.

With $13 billion in benefits and counting, EmPOWER is a proven platform for engaging customers and markets in diverse ways. Maryland must continue to invest in EmPOWER to achieve its energy-related objectives. At the same time, there is no room to rest on the laurels of past savings. The Commission and program administrators must confront two fundamental challenges as EmPOWER prepares for the next cycle:

- The need to transition buildings away from fossil fuels in order to achieve ambitious state policy objectives for reducing greenhouse gas emissions (60% across the state's economy by 2031, which is only two and a half 3-year cycles away), and

- The unsustainable inequity in energy burdens experienced by Maryland households, a problem that EmPOWER must do much more to address. (To date, EmPOWER spending has disproportionately benefited middle- and upper income households).

The Commission's Future Programming Work Group was an effective forum for digging deeply into how the program could evolve to further align with state policies. Many of the Work Group's recommendations were adopted by the Commission in Order 90261[7] including the transition to a goal based on lifecycle GHG.

EmPOWER is well-positioned to help address these challenges, but it will need to stretch and evolve to do in a sufficient and effective fashion. At the highest level, the programs evaluated in these comments need to evolve in at least four fundamental ways:

[7] ML 241115

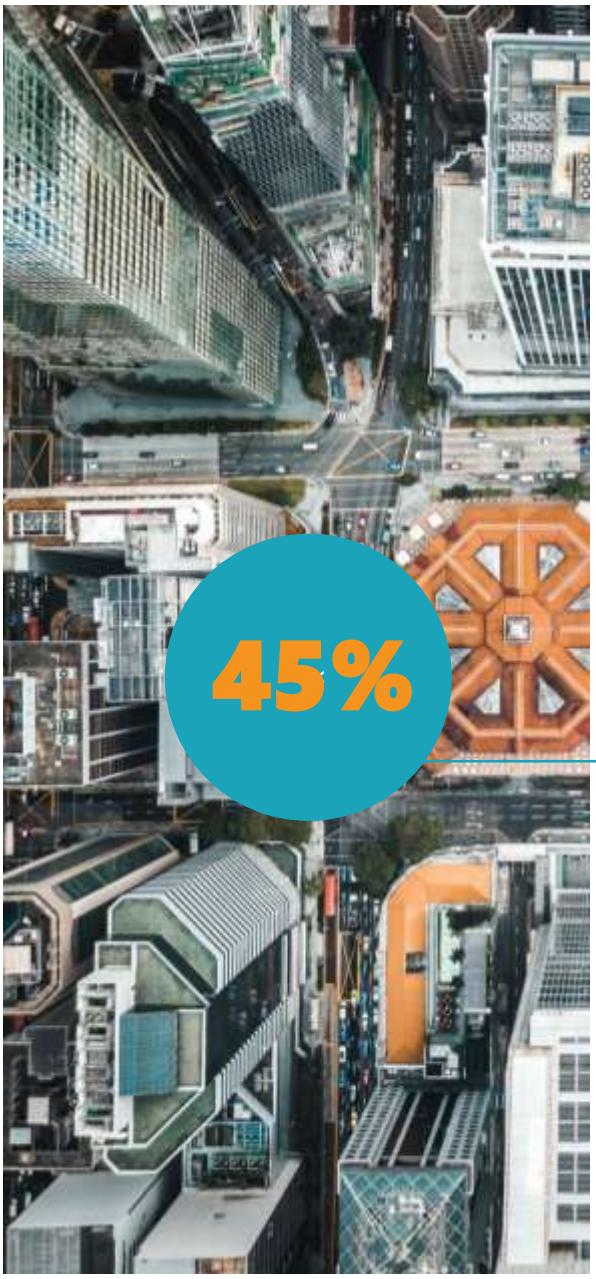
- The **depth and breadth of savings** must increase (even as the relatively cheap and plentiful savings from efficient lighting are largely behind us) with more ambitious program designs and strategies;
- As a whole, programs must deliver substantially **greater savings to limited income households**, through increased budgets for DHCD and greater support from the utilities, both of which are needed to reach many more eligible participants;
- **Beneficial electrification** must become embedded in most program areas, with a focus on heat pumps for space and water heating; and
- Programs and technologies need an increased focus on **managing when energy is used**, not only how much is used, which goes well beyond reducing peak demand on the hottest days of the summer.

Concurrent with the start of the next EmPOWER cycle, Maryland will begin to receive millions of dollars in funding from the federal Inflation Reduction Act (IRA). These funds are designed specifically to advance all of the objectives above, especially beneficial electrification with a focus on equity. The law also specifically directs that funding be used to *increase* savings, not be substituted for existing state funding. Maryland has a variety of options for how IRA electrification and efficiency incentives are delivered, but it is essential that the approach complement EmPOWER in a careful and deliberative way, with a focus on an integrated customer experience.

Currently EmPOWER includes incentives for customers to purchase more efficient natural gas-burning furnaces, water heaters, and other appliances. This equipment "locks in" a home's use of natural gas—both associated emissions and dependence on gas utility rates—for 10-20 years. New construction that is highly efficient but built around central gas heating (on top of an electric central air conditioner) makes a home unnecessarily dependent on gas for 30 or more years, unless it is subject to costly retrofits. In 2022, Washington Gas states that its new construction program was its most "successful" residential program because of record numbers of new homes receiving EmPOWER incentives to build in efficient use of natural gas.[8]

These program approaches are inconsistent with the need to dramatically reduce building emissions (consistent with 60% reductions across the economy) within the next eight years. While defensible in the past, by 2024 these incentives for gas appliances will also undercut the state's ability to leverage federal IRA funds to support market transformation. Maryland is not alone in struggling to transition from a focus on "more efficient" gas appliances to efficient electrification. Nor will it be alone in ending most gas appliance incentives. The EmPOWER GHG Abatement Potential study, discussed below, also found large opportunities to use energy efficiency to reduce natural gas use through measures that do not require ratepayer subsidies for gas appliances.

[8] Washington Gas Light Semi-Annual Report, February 15, 2023. P. 3.



GHG Potential Abatement Study

The EmPOWER GHG Abatement Potential Study ("study"), directed by the Commission, found an enormous, cost-effective opportunity to reduce GHG emissions utilizing EmPOWER programs in the next three years. According to the study authors, the estimated net benefit from pursuing even a subset of the cost-effective opportunities (the maximum acheivable) exceeds $20 billion.

The study found large amounts of potential GHG abatement in the areas of electrical and natural gas energy efficiency, beneficial electrification, and demand management. In the residential area, beneficial electrification represented more than 45% of the total achievable, cost-effective potential to reduce GHG.

The study also found that the achievable, cost-effective potential exists to save well over 2% of electricity sales, which is the EmPOWER statutory target for 2022-24. Finally, the study found that a large proportion of the opportunity for gas energy efficiency savings comes from "non-appliance" measures, such as weatherizing gas-heated homes, or improving the efficiency of hot water distribution in a home.

OPC has commented about the study in more detail in previous filings.

Planning for the Next Cycle

Stakeholder Engagement

Commission Staff filed a "Status Report on Time Frame and Stakeholder Engagement on the Program Planning Process" on February 17, 2023[9]. Attached was OPC Counterproposal to the Utilities' Stakeholder Engagement Strawman submitted to the ERPI work group.

OPC reiterates its strong support for a stakeholder engagement strategy that builds on procedural equity best practices and involves a large variety of Maryland stakeholders as active participants in EmPOWER program design. Figure 1 below describes the "public participation goals" and "promise to the public" associated with these public participation terms.

Under the approach directed by the Commission for the 2024-2026 program cycle, stakeholders who have not historically participated in EmPOWER program design will continue to have an extremely limited influence on utility-run programs.

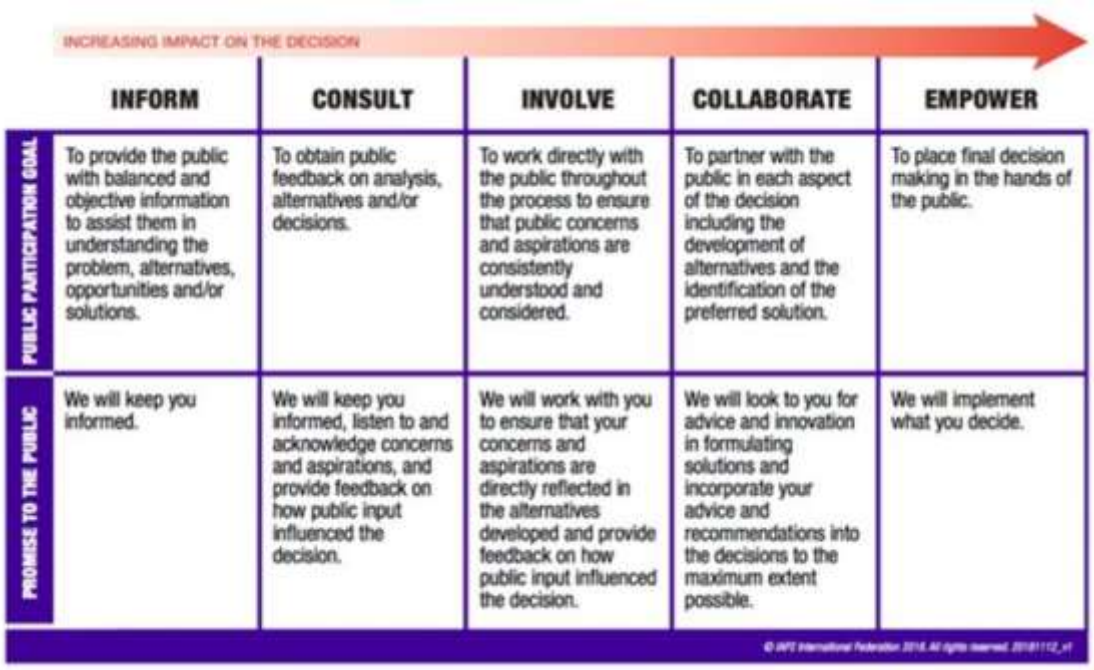


Figure 1. IAP2 Spectrum of public participation[10]

The Commission's recent order directing utilities to file program plans by August 1, 2023 and providing until October 15, 2023 for the filing of stakeholder's comments is a step in the right

[9] ML 301405

[10] International Association for Public Participation, IAP2 Pillars of P2 Brochure https://www.iap2.org/page/pillars (direct link to brochure: https://cdn.ymaws.com/www.iap2.org/resource/resmgr/communications/11x17_p2_pillars_brochure_20.pdf).

direction. However, for the 2024-2026 program cycle, the utilities' stakeholder engagement will continue to fall between "inform" and "consult" in the figure above, rather than in the "involve" column.

First, the timing of public participation is key: an EmPOWER Utility Planning and Stakeholder Collaboration Meeting in May (before June 1 per Commission order) will happen too late in the utilities' program design process for stakeholders' contributions to have a chance to influence major program decisions. For reference, DHCD kicked off its program planning for the 2024-2026 EmPOWER cycle with a brainstorming workshop in September 2022. Since then, DHCD has succeeded in engaging with customers' advocates: an early kick off signaled there was an opportunity for stakeholders to have an impact on DHCD offerings and customer engagement processes.

In addition, regulatory processes remain arcane to community-based organizations whose perspective, experience and expertise are invaluable: novel approaches to meaningful engagement are needed to unlock this potential. DHCD's experience demonstrates that with the right format organizations with limited resources are ready and eager to participate in targeted and strategic group conversations. OPC recommends that the EmPOWER Maryland Utilities submit a plan describing how they will move toward greater involvement and collaboration with stakeholders that have not participated in relevant EmPOWER proceedings and working groups as part of their 2024-2026 plan. This will catalyze the change needed to ensure all voices are heard throughout the design of the 2027-2029 EmPOWER cycle.

Beneficial Electrification

It is time for EmPOWER to include active, integrated promotion of beneficial electrification across most of its programs.

While new program tactics are needed, as well as new measurement and evaluation methods, electrification measures are close enough to energy efficiency measures in most ways that they fit within the EmPOWER platform without dramatic changes. Heat pumps for space conditioning (heating and cooling) and water heating are already EmPOWER measures. Incentives and outreach will need to evolve to capture the opportunity for customers to switch fuels along with embracing more efficient technology. Although quite mature in terms of performance, reliability, and versatility, heat pump technology remains less familiar to many installers and others in the supply chain.

Maryland can ill afford for evolution to happen this slowly. Heat pumps and beneficial electrification represent a critical pathway to meeting the state's climate objectives for buildings. The EmPOWER HVAC program is one of the most important channels for increasing the use of heat pumps. And yet the HVAC program has been the poorest performing in the EmPOWER portfolio for the last two years. Heat pump water heaters (HPWH), which fall under the Appliance program but use the same distributer-based midstream strategy, are also very lagging.

For these reasons, one of OPC's highest priorities for the next cycle is the selection of a single implementer to manage a best-in-class HVAC and HPWH midstream program for Maryland.

Summary of OPC Priorities for 2024-2026 Plans

Overall

- Electric utilities achieve statutory MWh savings goals using 85% behind-the-meter resources.
- Gas utilities achieve GHG reductions from energy efficiency that are at least as great as the Maximum Achievable GHG reduction scenario, for non-appliance measures, in the EmPOWER GHG Abatement Potential study.[11]
- Electric utilities prepare plans to achieve GHG reductions from electrification commensurate with the Maximum Achievable GHG reduction scenario in the EmPOWER potential study.
- EmPOWER funding for DHCD is increased to allow the agency to achieve the GHG reductions in HB 169/SB 144 (commensurate with the savings targets of an average of 0.75% of 2016 low income residential retail sales).
- EmPOWER program design and evaluation builds on a participatory process that fosters collaboration and stakeholder participation.

Electrification & IRA

- All retrofit, HVAC and water heating programs actively encourage fuel-switching and prioritize increasing incentives for heat pumps.
- EmPOWER ends incentives for gas appliances (except in specific circumstances).
- The utilities actively promote IRA benefits available to customers; ensure that any appliance incentives are consistent with both updated U.S. Department of Energy standards, and in the case of specific equipment, IRA standards. It should be a priority for the utilities to ensure that any IRA benefits can be stacked with their incentives and programs to avoid customer confusion, increase uptake, and provide greater benefits and savings to customers.

[11] There is no specific savings goal for natural gas in statute.

- Utilities conduct analysis of smart meter data to estimate the best prospects for electrification bill savings, including (especially) in limited income households; starting with BGE, which can use gas and electric data.

Appliances

- Employ a single implementer for the Energy Star Retail Products Platform
- Include more comprehensive appliance recycling concurrent with increased emphasis on equity.
- Move HPWH to the HVAC program for better integration with other equipment sold through distributors.

HVAC

- Utilities jointly employ a statewide implementer for midstream HVAC (with HPWH) programs to create uniformity in processes and procedures and therefore make it easier for distributors and contractors to participate.
- Significantly increase contractor and distributor education, recruitment and participation and track and report metrics.
- Eliminate incentives for central air conditioners.
- Develop incentives for non-contractor installed heat pumps (e.g. packaged window heat pumps) to increase access and affordability.

Home Retrofit

- QHEC & HEIP assess homes for electrification readiness.
- Home Performance incentive structure and measures are adjusted to include electrification retrofits.
- Utilities are not allowed to enroll Marylanders they know to be income-eligible in utility home retrofit offerings. Instead, these customers are automatically enrolled in DHCD-led programs.
- Expand financing to ensure moderate income customers have easy and affordable access to capital for residential retrofits; at least one utility should complete a tariff on-bill pilot during the next cycle.

New Construction

- Adopt latest versions of ENERGY STAR and ZERH of national voluntary program standards.
- Adjust incentive structures to:
    - Eliminate incentives for base ENERGY STAR tier
    - Provide higher incentives for an 'electrification-ready' tier: ENERGY STAR v3.2 or ZERHv2 plus ENEGY STAR Next Gen certification
    - Provide highest tier or incentive adder for all-electric homes
    - Add PHIUS ZERO certification incentive

Behavioral

- Greater use of AMI data to segment energy uses and target home energy reports.

- Overhaul behavior strategy and home energy reports for limited income households, including to more actively drive education about and participation in DHCD programs.

Low-Income

- Commission orders Staff to issue an RFP for and oversee a "market study" for low-income and other equity customers. The study seeks to understand current barriers associated with participation in EmPOWER low-income programming as recommended by APPRISE in the 2022 affordability study, as well as the causes of high energy burden.
- Assign low-income program participation goals to utilities, including for programs implemented by DHCD.
- Integrate electrification into LI programs with a focus on customers who will benefit from near and medium-term bill savings.

Demand Response

- Establish winter demand response programs and strengthen and expand existing DR programs, both to prepare for electrification and to address increasingly severe weather.
- Implement a residential grid-interactive water heating program.
- Ensure well-designed TOU and EV-charging rates are available for all customers.
- Increase participation in event-based residential DR programs.

EmPOWER performance in 2022

Overall EmPOWER Savings

In 2022, EmPOWER energy efficiency and conservation programs generated over 1.5 million MWh of lifecycle electricity savings, as much power as used in more than 150,000 homes in a year.

As shown in Table 2 below, in 2022 all electric utilities exceeded the statutory target of saving 2% of 2016 sales, when accounting for both savings accrued from residential, commercial and industrial programs and savings from non-EmPOWER funded programs the Commission has allowed the utilities to count toward goals in this cycle.

The Exelon utilities report achieving between 2.5 – 3.0% savings, including Conservation Voltage Reduction savings. The final column in the table shows the 2022 reported savings from EmPOWER-funded energy efficiency and demand response (EE & DR) programs only, expressed as a percentage of 2016 sales. Only BGE did not exceed 2% from EmPOWER-funded behind the meter programs. BGE and Pepco both claimed non-EmPOWER-funded savings of nearly 30% of total savings.

Under EmPOWER, each utility seeks approval from the Commission for a *forecasted* savings target for each year of its three-year plan. Averaged over the three-year cycle, those forecasts must meet statutory savings targets. For 2022, the forecasted savings of all utilities exceeded 2%.[12] Each utility except Potomac Edison exceeded its forecasted savings targets.

[12] SMECO forecast less savings in 2022 and higher amounts in 2023 (to average 2%), but it nonetheless achieved more than 2% in 2022.

Table 2: Reported electric utility savings compared to forecasts and baseline sales

Utility	2022 Forecasted Savings, MWh	2022 Forecasted Savings, % of Sales	2022 Reported Savings, MWh	2022 Reported Savings, % of Sales	2022 Reported *EE & DR* Savings, % of Sales
POTOMAC	156,953	2.12%	150,544	**2.03%**	**2.02%**
BGE	747,104	2.36%	811,665	**2.57%**	**1.84%**
PEPCO	406,045	2.79%	428,851	**2.95%**	**2.07%**
DPL	101,555	2.41%	106,070	**2.52%**	**2.08%**
SMECO	60,951	1.80%	74,337	**2.20%**	**2.20%**

The EmPOWER statute has no statutory gas savings targets. However, the Commission establishes such targets for gas utility plans administratively, and the gas utilities are required to forecast savings for each year of their Commission-approved plans. In 2022, the gas utilities fell short of their overall savings targets. BGE, for example, achieved less than half of its forecasted gas savings. Two thirds of the way through the 2021-23 cycle, BGE has achieved only one-third of the forecasted gas savings, while Washington Gas has achieved only one-half of its forecasted savings. This is at least the fifth consecutive year Washington Gas has failed to meet its forecasted savings. (To meet its cycle goal, Washington Gas would need to achieve as much savings in 2023 as it did in 2021 and 2022 combined and BGE would need to *double* its savings from the past two years.)

Table 3: Reported gas utility savings compared to forecasts

Utility	2022 Forecasted Savings, therms	2022 Reported Savings, therms	2022 Reported Savings, % of Forecast
WGL	2,403,675	1,860,458	77%
BGE	5,367,483	2,400,587	45%

Residential Savings

All EmPOWER electric utilities are exceeding cycle-to-date savings forecasts while spending below budget.

As in the past, the focus of our analysis is on residential programs. Each utility's CTD residential savings compared to their forecasts—and spending compared to budgets—is shown in Figure 2. For BGE, the figure represents electric savings performance. WGL is the only utility not meeting its forecasted savings targets for residential programs. SMECO stands out for saving more than 125% of its savings forecast while spending less than 75% of its budget.

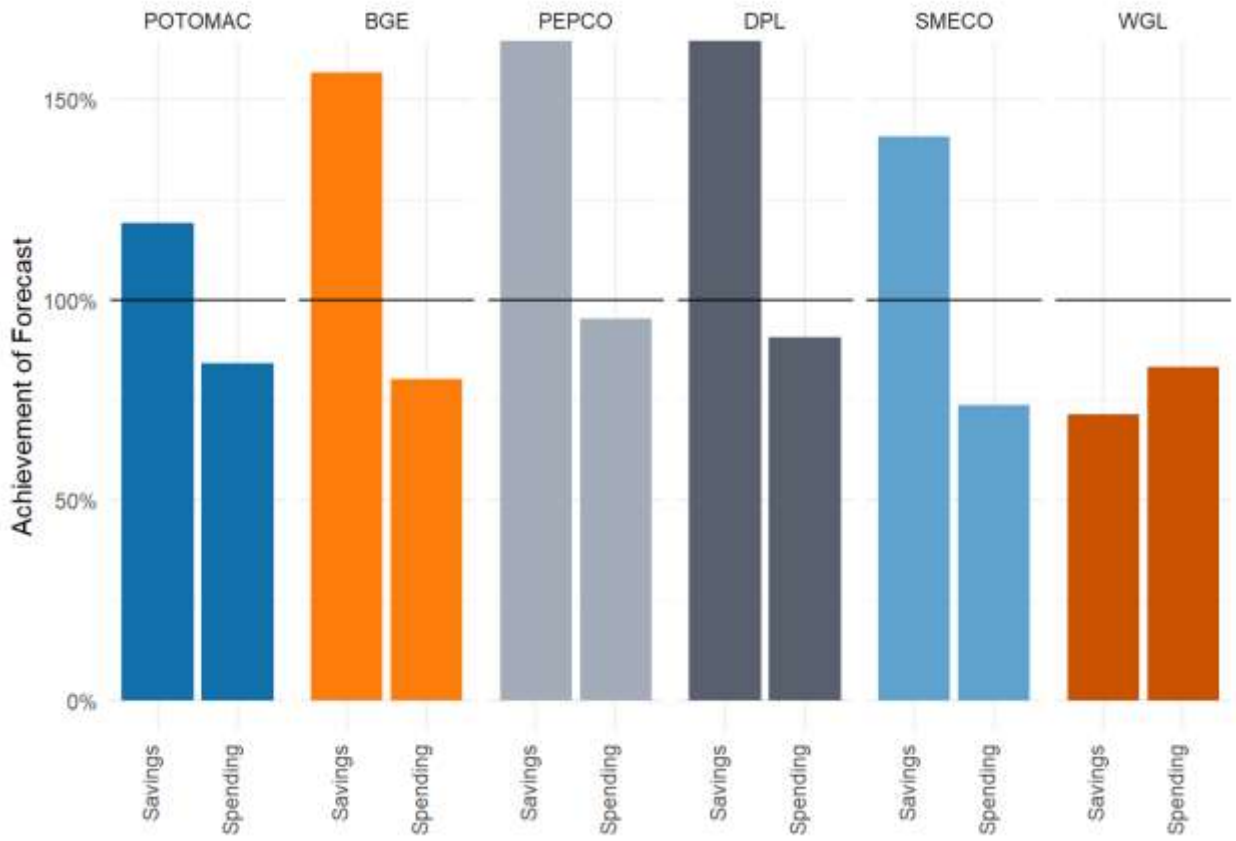


Figure 2: CTD residential portfolio achievement of forecasted goals.

Behind those residential portfolio totals is highly varied performance by program and by utility. The next section includes a closer review of individual programs, but Figure 3 gives a snapshot of each electric utility's performance in the major program areas.

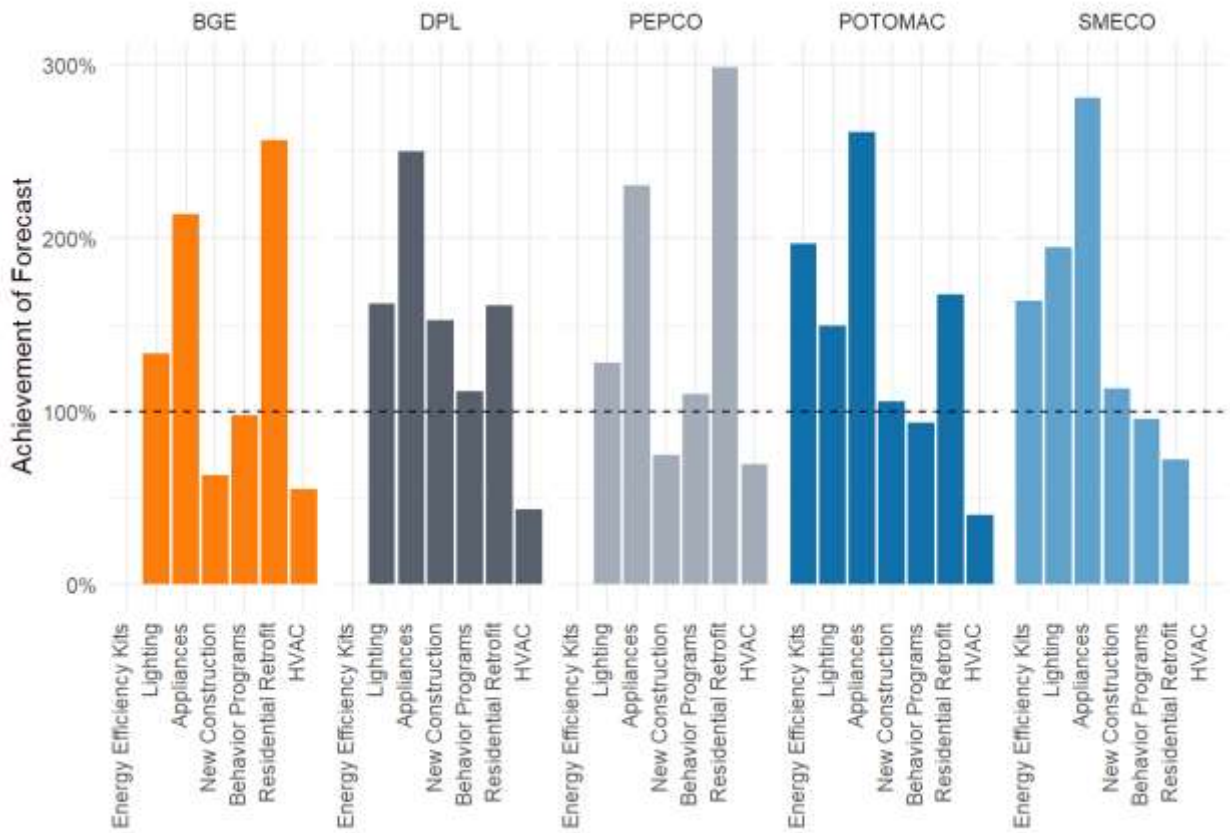


Figure 3: CTD achievement of forecasted savings in major program areas.

The figure reveals consistently high savings in the Appliance category and near consistently poor performance in the HVAC category (SMECO being the exception). No utility is achieving its forecasted savings across all of the major program areas. Delmarva is performing adequately or well in every area except HVAC. On the other end, BGE is achieving its overall residential savings target despite achieving 100% in only three of six major program areas. (Note that only Potomac and SMECO have an Energy Efficiency Kits program.)

For a final snapshot of residential portfolio performance, Figure 4 shows the aggregated achievement of forecasts for the major program areas, from summing together all the electric utility savings and spending compared to their forecasts. This figure takes into account the size of different utilities to reflect absolute (not relative) progress across EmPOWER as a whole. As seen in Figure 2, above, New Construction demonstrates the most variance across utilities; the fact that the two largest utilities are behind target puts the program overall somewhat behind target. HVAC again stands out for poor performance overall; in other areas the electric utilities are on track.

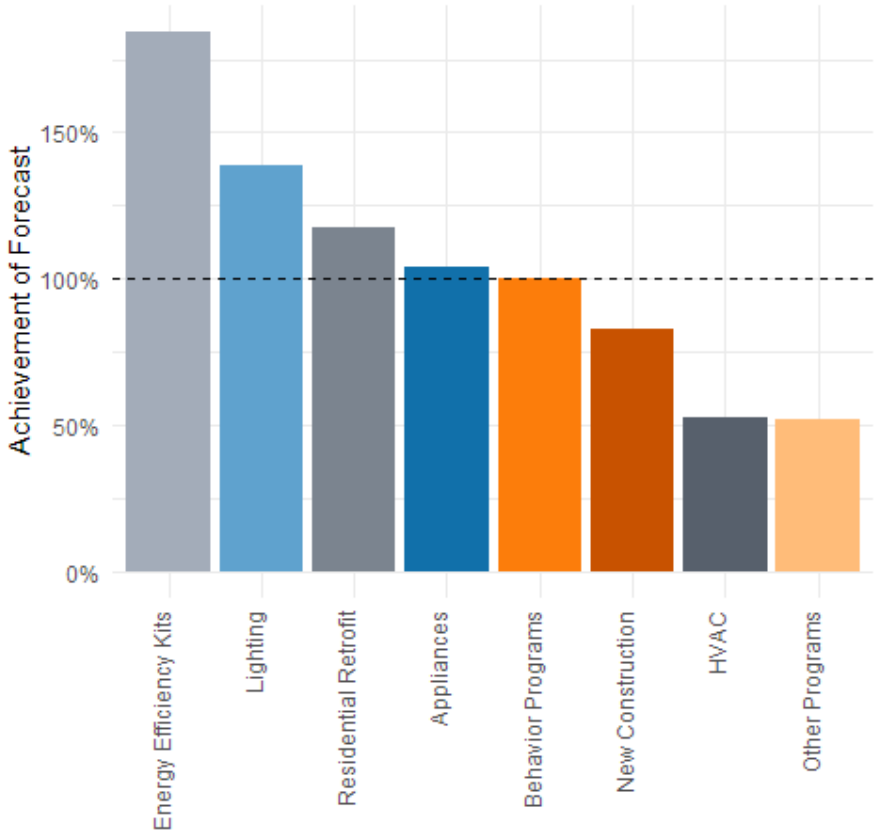


Figure 4: CTD achievement of forecasted savings in major program areas, aggregated of all electric utilities

Looking at the gas utility residential portfolios, shown in Figure 5, we see the biggest driver for WGL not meeting forecast is underperformance in the Residential Coordinated program, which is WGL's contribution to gas-saving measures in the residential retrofit programs administered by the electric utilities.

BGE continued to substantially underperform in its gas-saving programs, meeting less than 50% of CTD savings forecasts and failing to hit targets in any program area. BGE's own residential retrofit program also struggled to achieve gas savings.

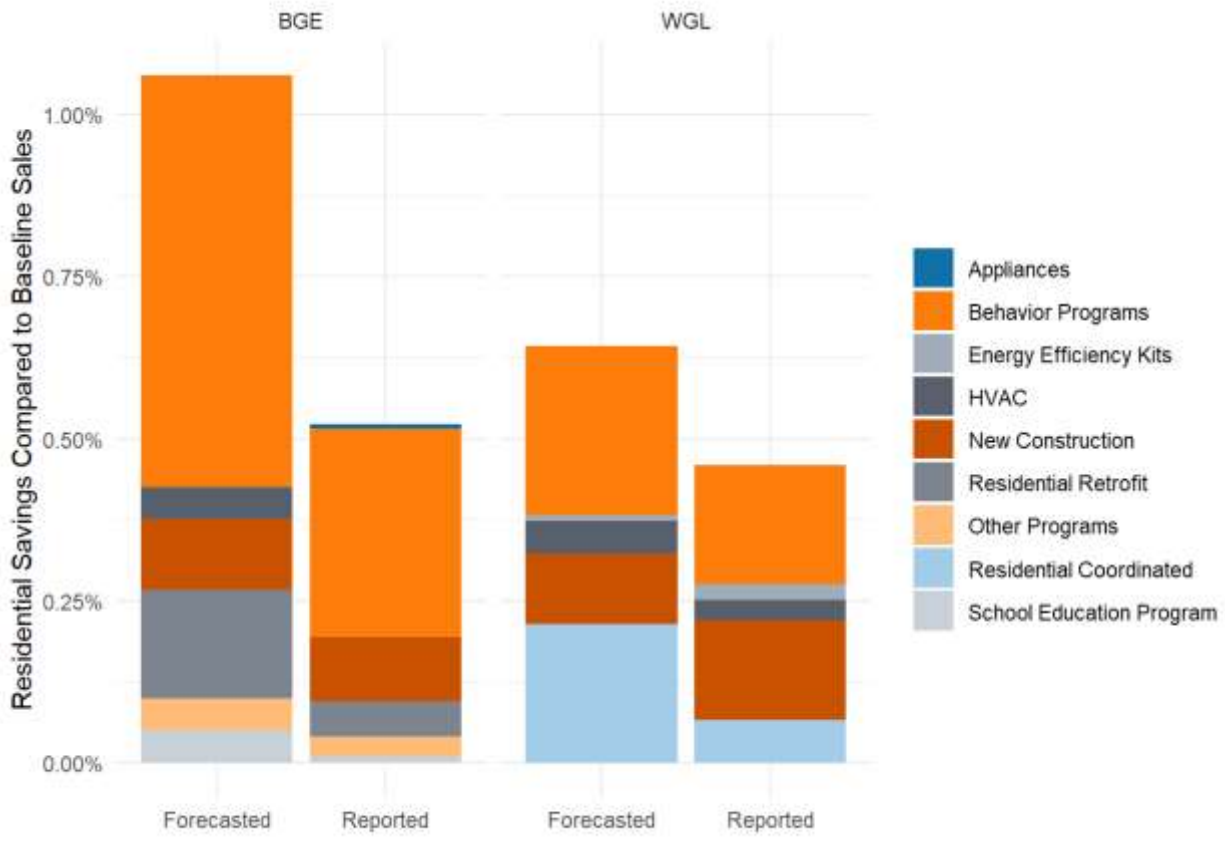


Figure 5: CTD achievement of forecasted gas savings in major program areas.

Both gas utilities—and especially BGE—fell meaningfully short of savings targets in the Behavior Program. This is particularly troubling because this program does not rely on the installation of long-lived gas appliances (which will emit greenhouse gases for a decade or more) and was forecasted to account for a large share of EmPOWER gas savings this cycle.

Greenhouse Gas Reductions

Greenhouse gas emissions reduction for 2022 and for the cycle-to-date have been provided by the Commission's independent evaluator. Those reports show that in 2022, EmPOWER programs of the utilities and DHCD generated 1.77 million metric tons of GHG emission reductions on a gross lifecycle basis.[13]

For the CTD, EmPOWER programs generated 3.57 million tons of GHG reduction, with residential programs accounting for 1.57 million tons. Residential GHG reductions by program administrator are shown in figure 6.

[13] Of the two sets of emissions results provided by the evaluator, we are using those associated with the Maryland Department of the Environment's "Policy case". Members of the Evaluation Advisory Group agreed that this case will be appropriate to use for 2024-2026 planning, as it reflects expected power plant emissions under a scenario where Maryland achieves its overall GHG policies.

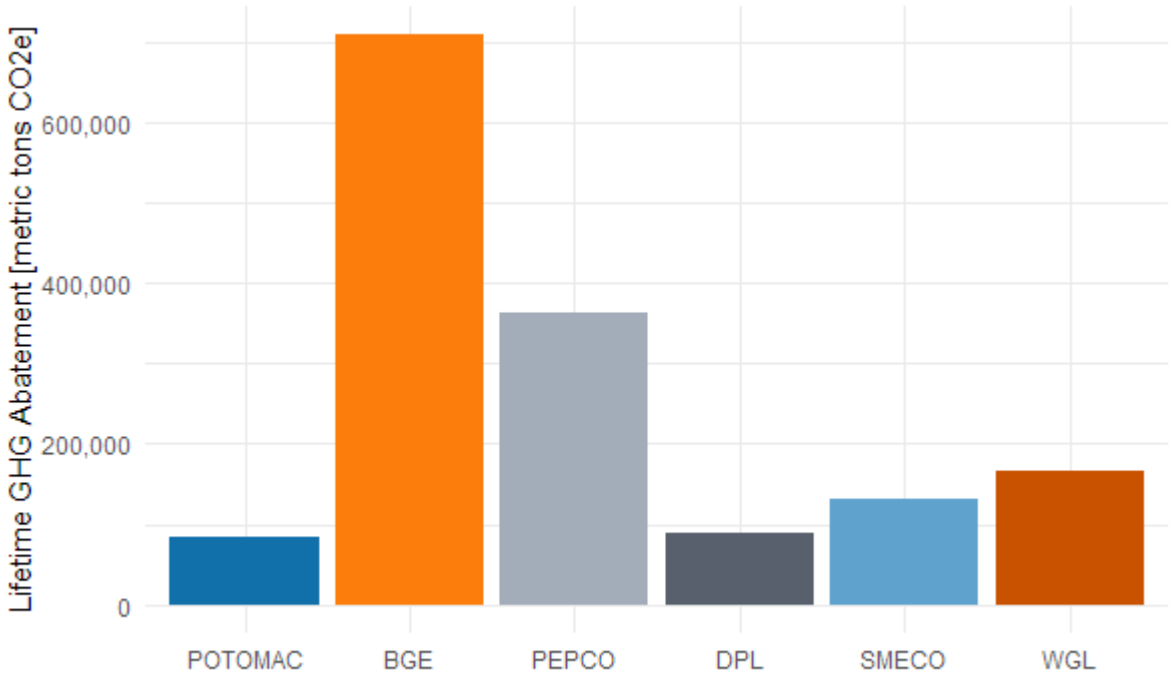


Figure 6: CTD residential greenhouse gas reductions (lifecycle) by program administrator

The residential share of total GHG emissions reductions is 44% of overall EmPOWER GHG reductions, a percentage that aligns with the residential share of electricity sales in Maryland. The share of GHG reductions coming from residential programs varies significantly across utilities, however, as shown in table 4.

Table 4. Residential share of total greenhouse gas reductions CTD, by program administrator

	Residential share of Lifecycle GHG, CTD
Potomac	28%
BGE	47%
Pepco	40%
DPL	30%
SMECO	49%
WGL	68%
DHCD	**97%**
Total	**44%**

As utilities develop their 2024-2026 plans around a lifecycle GHG metric, we expect they will focus in a new way on balancing programs across the residential and non-residential sectors. This will be especially important for Potomac Edison and Delmarva.

When we compare the electric utilities' GHG reductions to the volume of electricity sales we see very substantial differences. Figure 7 shows each utility's total GHG reduction (on a gross lifecycle basis) in proportion to their electricity sales (using the 2016 baseline).[14] Delmarva stands out by achieving more than twice as much GHG reduction in proportion to sales than Potomac Edison or BGE.

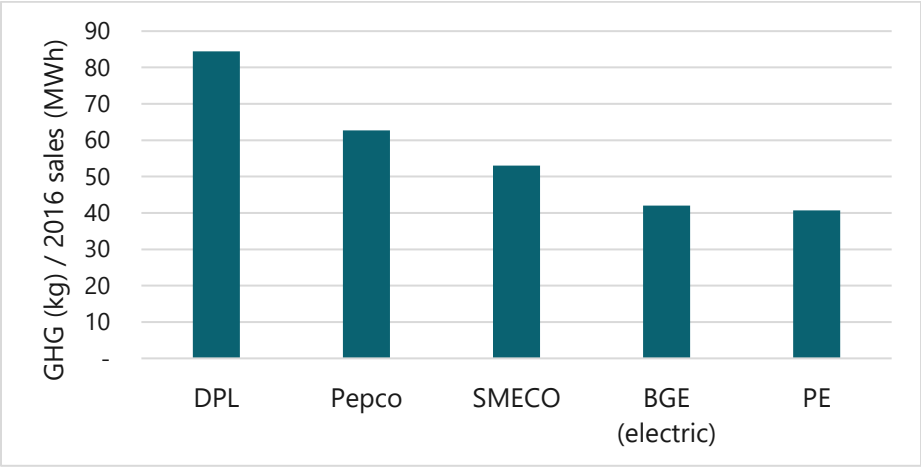


Figure 7: Total GHG reductions (lifecycle) from electricity savings per unit of electricity sales, CTD

Demographic differences do not adequately explain this variation; programs, measures and incentive choices are also drivers. By measuring and reporting on GHG as an important metric in EmPOWER, utilities will have a greater impetus to understand and emulate what their counterparts are doing to achieve strong GHG results.

Figure 8 below provides two views of the relative contribution each program area made in 2022: measured as MWh and GHG. Only electric utility programs are included to provide an even comparison. With this view, we see programs with longer lived measures (New Construction and Residential Retrofit) play a greater role. At the same time, even though the behavior programs are deemed to avoid energy use only for one year, avoided GHG emissions in the near term are also deemed to be greater than those in future years as the electric grid becomes cleaner. This—along with large absolute savings—helps the behavior program contribute large amounts of GHG reduction.

[14] To create a fair comparison, only BGE's GHG reductions from electricity savings are used.

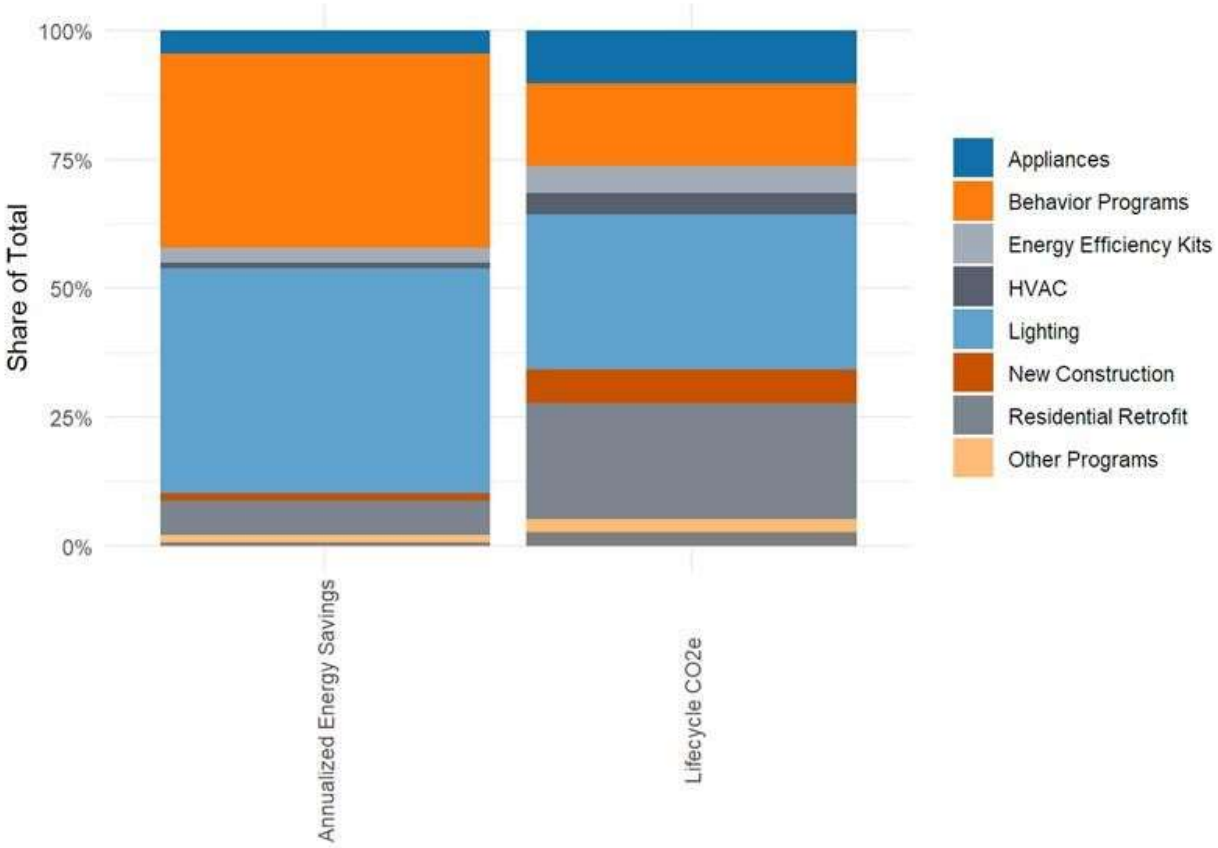


Figure 8. Residential programs contribution to residential electric savings in 2022, measured as annual electricity savings and lifecycle GHG savings.

Program-specific observations and recommendations

Programs reviewed

- Lighting
- Appliances (rebates & recycling)
- Residential retrofit
- HVAC
- Smart thermostats
- Behavior
- New construction
- Limited Income - DHCD
- Demand response

In the following pages we offer specific evaluation of how the major programs performed in 2022. Most sections include a comparison of performance against forecasted targets, for savings, participation, and/or spending. Some also include an evaluation of cost to achieve savings or trends over time, especially if there are noteworthy differences between utilities or over time.

Each section also describes how performance and program characteristics in the current cycle should inform plans for the 2024-2026 cycle.

We make no specific recommendations for the Commission or program administrators concerning changes to programs for this cycle. We do encourage the Commission, in its post-hearing order, to provide evaluative comments and guidance that will help utilities and DHCD develop their 3-year plans for the 2024-26 program cycle.

As described in the Limited Income section, we also recommend the Commission immediately direct Staff to initiate a more comprehensive study on limited income participation barriers and factors for high energy burden.

Lighting

The EmPOWER Retail Lighting programs provide instant discounts for light-emitting diode (LED) products sold via retail channels, pop-up lighting events, online marketplaces and through partnerships with Maryland food banks targeting limited income customers. In 2022 federal standards for general service lighting increased to levels that effectively transformed residential lighting to higher efficiency LED technology. As such, absent new program strategies, the 2022 program year will be the final full year of traditional retail lighting programs for EmPOWER utilities.

All EmPOWER electric utilities are exceeding 125% of CTD savings forecasts, but ended retail lighting programs in March 2023 in response to federal standards, market developments, and Commission orders.

2022 Lighting Performance

Utilities sustained strong participation throughout 2022, adding additional high efficiency lighting products and new promotional strategies in the program. Figure 9 illustrates lighting program performance across the utilities cycle-to-date, highlighting the continued success in meeting and exceeding savings goals within budgeted program spending.

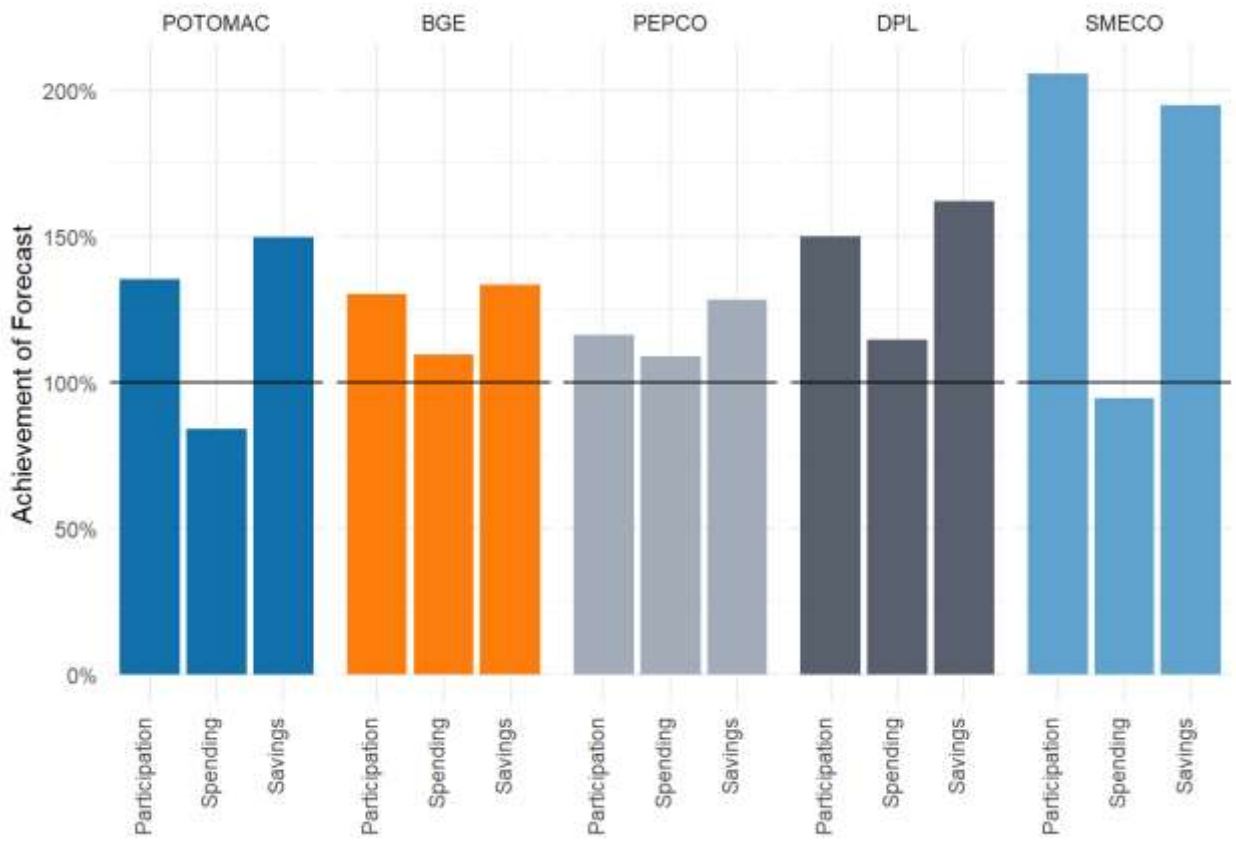


Figure 9: Cycle-to-Date lighting program achievement of forecasted goals.

All five EmPOWER electric utilities are exceeding 125% of cycle to date savings forecast, led by Potomac Edison, Delmarva and SMECO - at or above 150% of forecast – while remaining at or below budget for spending.

In July 2022 the Department of Energy (DOE) issued two separate final rulings related to federal standards for general service lamps that are impacting how the EmPOWER upstream Lighting programs promote high efficiency LEDs, and their ability to contribute significant and cost-effective energy savings to the program.[15] To support the market transition, the DOE exercised its discretion to allow for a sell-through period, with initiation of financial penalties delayed until November for manufacturers or importers and March 2023 for sale by retailers and distributors.

As of the end of March 2023, EmPOWER utilities are sunsetting retail lighting programs, but will sustain targeted light bulb promotions through the end of June with regional Maryland

[15] The first ruling effective July 8, 2022 created a more inclusive definition of General Service Lamps (GSLs) to encompass the majority of residential lighting bulb types. The second ruling instated a 45 lumens per watt performance requirement – a level at which currently only high efficacy LED technologies can meet.

foodbanks and hard-to-reach stores serving lower income households. Leading this trend was SMECO, which distributed 55% of its lighting program bulbs through foodbanks and related limited-income initiatives.

Following the lead of SMECO, utilities were approved to transition unused budget to the Appliance Rebate, HVAC, and New Homes programs.

Each utility is in the process of re-allocating incentive budgets from lighting to other program areas. Rapid diversification of the residential program portfolio in 2023, as well as increased investments will be necessary to ensure the continuity and cost-effectiveness of EmPOWER residential programs in absence of retail lighting.

EmPOWER electric utilities cost per lifecycle savings generally continued to increase over the last two years due to a ramp up of bulb distributions through Maryland foodbanks, as well as the reduction of the effective useful life (EUL) of LEDs from the effective date of higher federal standards in 2022. Figure 10 shows the cost per lifecycle MWh savings across the utilities in 2022. SMECO's higher cost per MWh likely reflects their more intensive efforts to provide free bulbs through foodbanks.

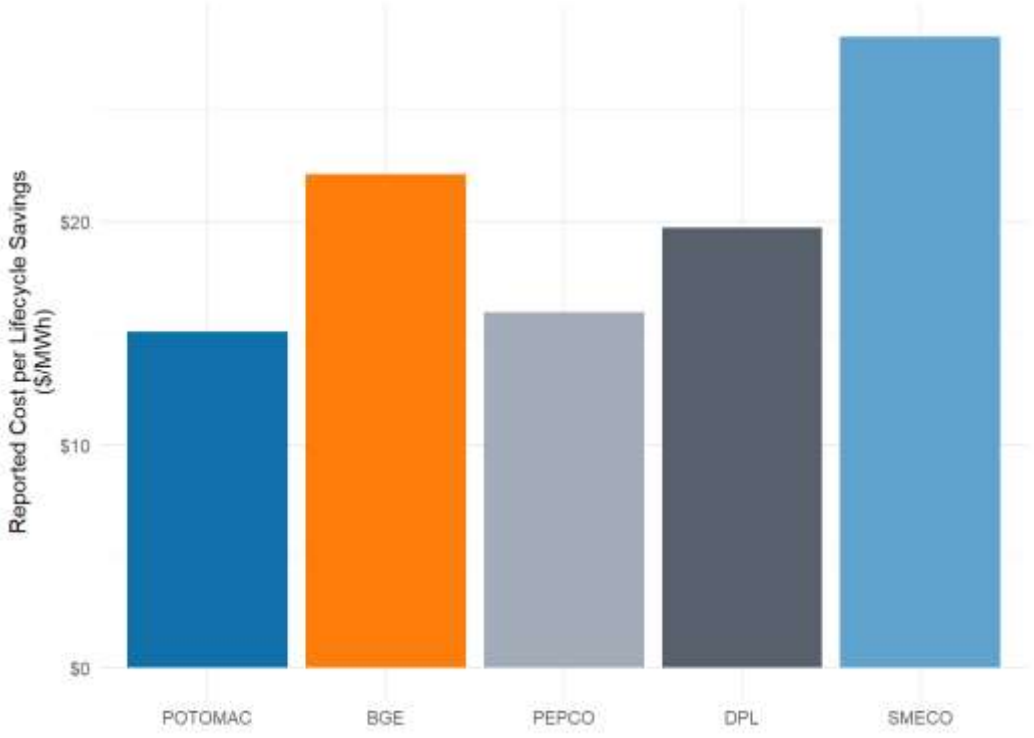


Figure 10: Lighting program reported cost per lifecycle savings, 2022

Priority Lighting Recommendations for 2024-2026

Although retail lighting programs will be ending, we recommend that evaluators assess retailer shelf stock in Maryland, as well as low price and higher performance LED models to assess remaining opportunities for EmPOWER utility programs to impact savings and performance of retail residential lighting. An example of a market transformation program that continues to deliver impact is the Energy STAR Retail Products Platform (ESRPP), used in the Appliance Rebate program, which offers incentives to retailers to incrementally improve sales of higher efficiency models. We recommend that utilities and evaluators assess opportunities for developing new market transformation programs in retail lighting and determine whether the Retail Products Program – or similar market transformation approach - might deliver ongoing impact in lighting for EmPOWER programs.

In addition to supporting increased efficacy of LED products, additional metrics including power factor, dimmability and occupancy/daylight sensors are opportunities for efficiency and grid impacts. As part of a proposed revision of federal standards, integrated LEDs will be required to have a higher power factor and increase efficacy.[16] Federal agencies expect innovation in solid state lighting to further increase efficacy by 2050. The compliance date for the proposed standard is set for 2028, creating an important opportunity for utility programs to support market transition and adoption of higher performance residential lighting.

We recommend that utilities work proactively with a reconstituted Lighting Work Group to assess, and plan for any remaining market impact and savings opportunities in residential retail lighting. With retail lighting programs sunsetting, it is important to maximize the current industry partnerships developed through the EmPOWER program and sustain momentum in the 2024-2026 program period.

In 2022, SMECO distributed **55% of bulbs to limited income households** through foodbank and related distributions.

Appliance Rebate

The Appliance Rebate programs offer instant, online, and paper rebates for select ENERGY STAR products, including room air conditioners, dehumidifiers, room air purifiers, heat pump water heaters, refrigerators, freezers, clothes washers, clothes dryers, pool pumps, advanced power strips, and smart thermostats. The EmPOWER electric utilities deliver Appliance program rebates through separate "downstream" and "midstream" channels, which seek to influence equipment purchases in different ways.

2022 Appliance Rebate Performance

Figure 11 illustrates appliance program performance across the utilities cycle-to-date with all five EmPOWER electric utilities exceeding energy savings and participation forecasts, while staying approximately at or below their forecasted spending levels for the cycle period. It is noteworthy that SMECO achieved nearly double their forecasted savings and participation for 2022, while staying under budget, with Potomac Edison showing results that are nearly as impressive.

[16] https://www.regulations.gov/document/EERE-2022-BT-STD-0022-0005

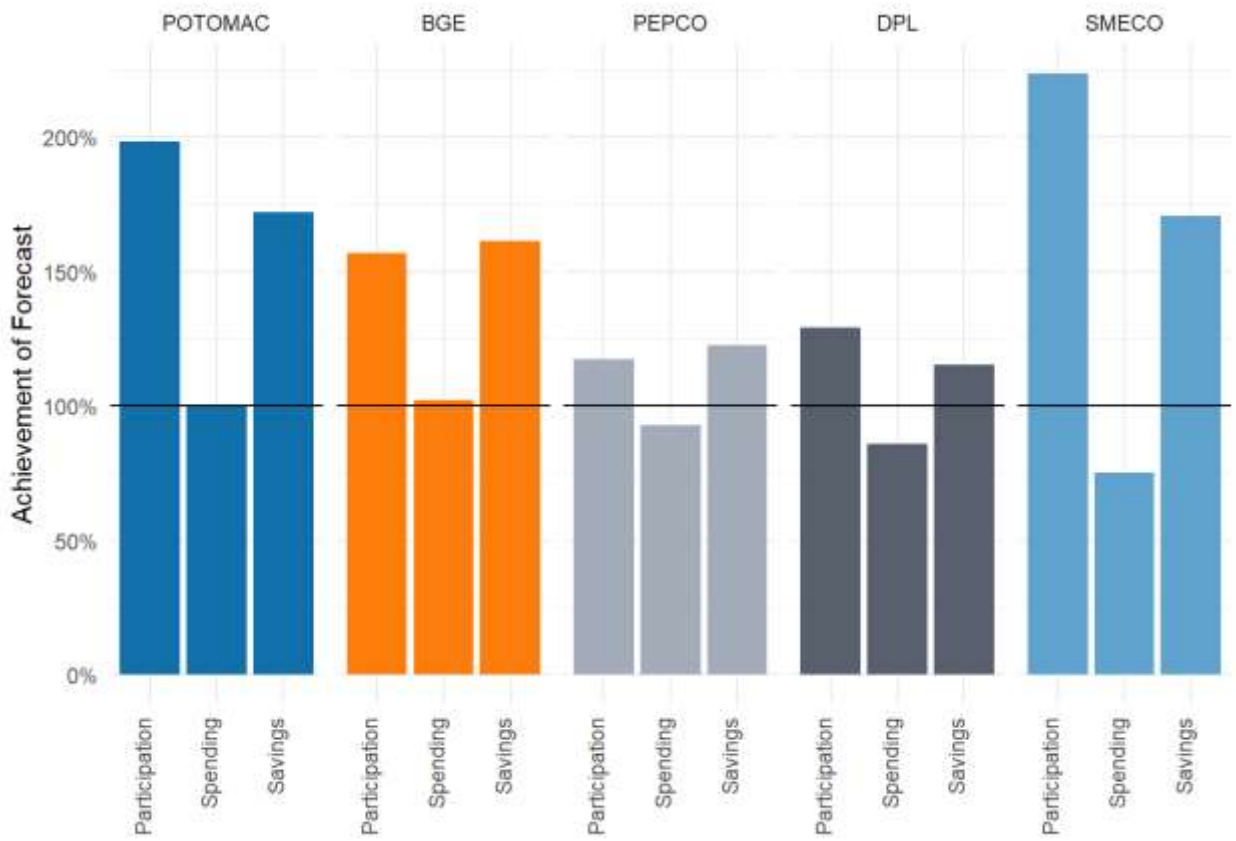


Figure 11: Cycle-to-Date appliance rebate program achievement of forecasted goals.

As noted in previous Semi-Annual comments, and above, the EmPOWER utilities' efforts with heat pump water heaters (HPWH) – a significant opportunity for savings – continues to be of particular concern in failing to capture any substantive market share of Maryland water heater market. As part of the Midstream Work Group in 2022, a benchmarking study was completed highlighting an inconsistent set of rebates and processes being offered between utilities, as well as identifying successful market strategies in other regional states. Specifically, a streamlined midstream (distributor) HPWH strategy supported dramatically higher participation as a percentage of electric water heater sales.

Based on a 2022 report[17], nationally 45% of residential electric water heaters are purchased through distributors (e.g. by contractors who purchase them from the distributor to install for end-use customers) and 55% through retailers.[18] The continued underperformance of the HPWH midstream distributor program is highlighted by the fact that only Delmarva and SMECO reported midstream participation of more than 10 units in the second half of 2022.

[17] 2022-03 Preliminary Analysis Technical Support Document: Energy Efficiency Program For Consumer Products And Commercial And Industrial Equipment: Consumer Water Heaters, Department of Energy, March 2022. https://www.regulations.gov/document/EERE-2017-BT-STD-0019-0018

[18] The rest are purchased through retail stores (either by contractors or by the customers themselves).

Notably BGE had a significant drop in participation in both retail and distributor promotions. Across the EmPOWER utilities, midstream distributor program participation was less than one-fifth of its retail program, despite distributor sales nearly doubling from the first half of the year. Figure 12 and Table 5 below shows the breakdown of HPWH participation by market channel, as well as estimated market share as a percentage of naturally occurring electric water heater replacements. (Market share of all water heater replacements would be far lower still.) Of the five EmPOWER electric utilities, only Potomac (3.1%) exceeded 2% HPWH sales as a percentage of naturally occurring electric water heater replacements. Other states - notably Vermont and Maine – have reported greater than 60% market share.[19,20]

EmPOWER utilities on average are converting less than 1.5% of the estimated annual replacement of electric water heaters to efficient heat pump water heaters. At that rate, it would take nearly 1,000 years to convert all the electric resistance water heaters in Maryland.

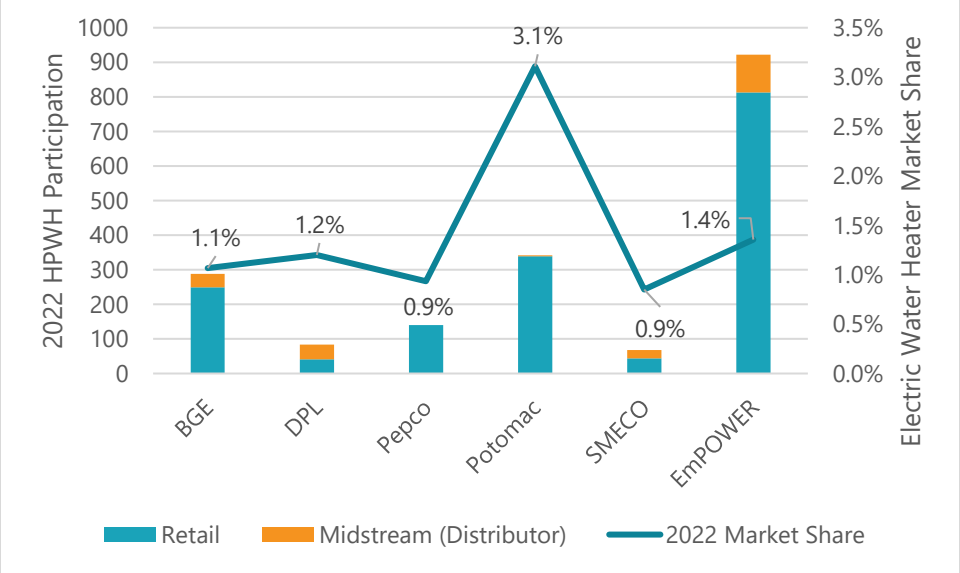


Figure 12: HPWH participation by channel, and estimated HPWH market share

[19] https://www.energystar.gov/sites/default/files/asset/document/2019.09.11%20Booher%20ESPPM%20HPWH%20Market%20Mechanics%20Revealed_Final%20%28002%29.pdf, p.11.

[20] https://www.energystar.gov/sites/default/files/asset/document/3.%20Andy%20Meyer%20-%20Efficiency%20Maine%20-%20Sucessful%20Strategies%20for%20Going%20Midstream-%20HPWH%20-%20508%20Compliant.pdf, p. 10.

Table 5: Number of HPWH incentives in 2022 by channel and water heater market share.

Utility	Customers w/ Electric WH		Annual Electric WH Replacements[21]	Retail Incentives		Midstream Incentives (Distributor)		Total Incentives		2022 Market Share
	%	#		Q2	Q4	Q2	Q4	Q2	Q4	Full Year
BGE	30%	355,590	27,000	150	99	33	6	183	105	1.1%
DPL	62%	86,617	7,000	32	9	1	42	33	51	1.2%
Pepco	36%	195,211	15,000	72	68	0	0	72	68	0.9%
Potomac	60%	148,583	11,000	162	177	3	0	165	177	3.1%
SMECO	70%	107,800	8,000	26	18	1	23	27	41	0.9%
EmPOWER	**39%**	**893,801**	**68,000**	**442**	**371**	**38**	**71**	**480**	**442**	**1.4%**

On April 5, 2021, the EPA released an updated ENERGY STAR Water Heater specification V4.0 that included several significant updates that will impact the EmPOWER Appliance Rebate program and HPWH measure. These updates include:

Change in definition of eligibility, away from capacity and towards performance,

Development of subcategories for HPWHs[22], and

Addition of optional connected criteria for providing grid services

Any HPWH manufactured after January 5, 2022, must be certified to V4.0. The EmPOWER Maryland Heat Pump Water Heater Baseline and Market Assessment[23] (May 2020) provided updated savings and net-to-gross values for EmPOWER utilities that are reflected in the February 2020 revisions to the EmPOWER Technical Reference Manual (TRM)[24]. However, Pepco and Delmarva reported significantly lower average annual per unit HPWH savings of approximately 1,600 kwh compared to the other utilities exceeding 2,000 kWh. We recommend that all EmPOWER utilities in future program filings review and reflect recent

[21] Assuming water heaters are replaced after 13 years on average.
[22] Integrated HPWH UEF ≥ 3.30; Integrated HPWH, 120 Volt / 15 Amp Circuit UEF ≥ 2.20; and Split-system HPWH UEF ≥ 2.20
[23] https://docs.google.com/document/d/1o6fWWCGYZPlGUFyBDMXdkqndxMSy0rhE/edit#
[24] EmPOWER Maryland Evaluation Public Documents – Interim Supplements Catalog TRM 19.0 - https://docs.google.com/document/d/1e92tpwmQ-Q9mKbm3dYRsdzg3QjHmnofd/edit

ENERGY STAR specification and EmPOWER Maryland TRM changes, which, if adopted, would lead to significantly increased savings for all HPWH models, but especially those with greater than 55-gallon capacity.

EmPOWER utilities should evaluate market opportunities to support new subcategories of heat pump water heaters, notably 120V HPWHs, which can avoid the need to upgrade electrical service panels, as well as the introduction of advanced tiers to support higher efficiencies and grid service capabilities in 2022.

As previously noted in Q2 2022 comments, two new appliance measures – dishwashers and water coolers – were introduced by Potomac Edison in Q1-Q2 2021 and warrant closer attention, because these appliance categories have not had ENERGY STAR specifications revisions since 2016 and 2014, respectively. Dishwashers have a 2021 "Most Efficient" product category, but the Potomac Edison website appears to simply support any ENERGY STAR dishwashers, which already have a 100% market share according to the 2020 ENERGY STAR Shipment Summary Report.[25] A new ENERGY STAR dishwasher specification (V7.0) was released, but is not effective until July 2023.[26] Similarly a new specification for ENERGY STAR water coolers (V3.0) became effective in March 2022, but considering the relatively high market share of 58% for the previous specification, Potomac Edison should verify program qualified product lists were updated accordingly for instant rebates.

Now that ENERGY STAR V7.0 is finalized, we recommend that Potomac Edison specifically require dishwasher models meet the new specification for the Appliance Program.

[25]https://www.energystar.gov/sites/default/files/asset/document/2020%20USD%20Summary%20Report_Lighting%20%20EVSE%20Update.pdf
[26]https://www.energystar.gov/sites/default/files/asset/document/ENERGY%20STAR%20Version%207.0%20Residential%20Dishwasher%20Final%20Specification.pdf

Priority Appliance Rebate Recommendations for 2024-2026

HPWHs should be moved out of the Appliance Program and be included with HVAC measures in recognition of (a) the importance of a unified distributor-based midstream strategy for both classes of equipment, and (b) their importance for state climate objectives. VEIC supports the use of retail incentives and the ESRPP to promote HPWH; this should be more strategically coordinated with midstream approaches. After more than a year of Work Group deliberation, we still conclude that midstream program design and implementation (and transparency) will be improved by including HPWH and HVAC in the same program—with a single midstream implementer statewide.

EmPOWER utilities should adopt new subcategories of HPWH, notably 120 volt HPWHs, as well as the introduction of advanced program tiers to support higher efficiencies and grid service capabilities in 2022.

EmPOWER should establish uniformity of appliance programs across all utilities and select a single ESRPP implementer. As part of this shift, EmPOWER utilities should evaluate opportunities to leverage ESRPP's scale to bring new emerging technologies into the Maryland market, as well as assess a future opportunity to increase performance of LEDs.

Innovation and electrification should be integrated into the program. Utilities should accelerate and expand investments to rapidly identify, pilot and deploy at scale new technologies and program strategies. Emerging technologies like ENERGY STAR electric vehicle supply equipment, advanced refrigerators, window-installed heat pumps, induction cook tops, and smart window shades are examples of innovations that may require different strategies beyond the existing established retailer partnerships.

Appliance Recycling

The Appliance Recycling program encourages the early retirement and recycling of inefficient operating appliances by offering customers a rebate and free appliance pick-up. The program primarily targets recycling of refrigerators and freezers, but also offers ancillary pick-ups for room air conditioners and dehumidifiers in addition to local community turn-in events.

2022 Appliance Recycling Performance

The EmPOWER utilities' Appliance Recycling programs offered combinations of limited time offers (LTO), aggressive marketing and options for curbside or indoor contactless pickup and to strengthen participation. However, some utilities continued to report appliance market conditions as a barrier to participation in recycling programs, experienced as recycling program competition with robust second-hand appliance markets.

As shown in Figure 13, three of the five electric utilities exceeded their cycle-to-date appliance recycling targets for forecasted savings, and Potomac reported 90% of its savings target. BGE reported approximately 50% of its savings goals. This pattern is a continuation from 2021. With spending below forecast, BGE and Potomac Edison should be initiating more limited time offers and special events to drive more participation.

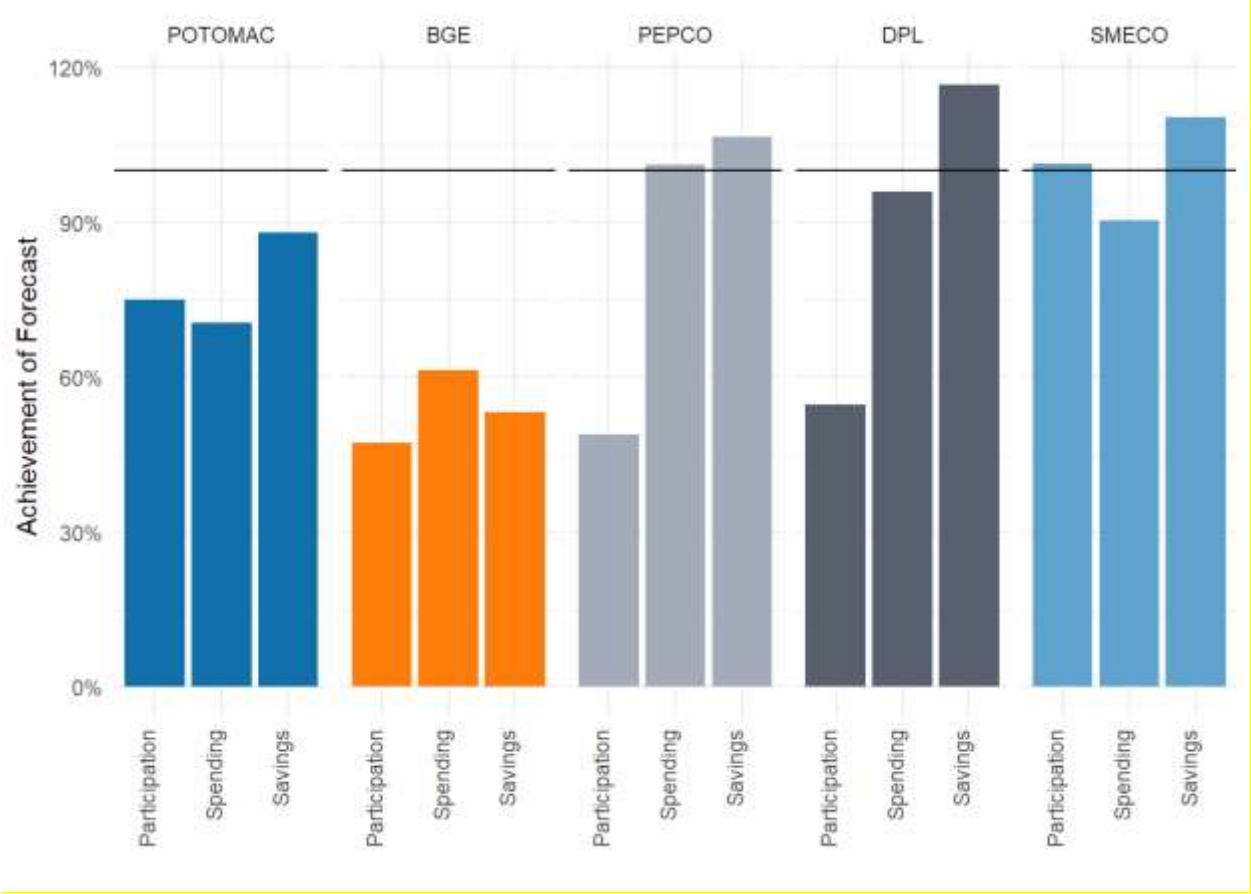


Figure 13: Cycle-to-Date appliance recycling program achievement of forecasted goals.

Removing used inefficient appliances from the market provides energy savings and ultimately reduces consumer utility bills. At the same time, we recognize that the secondhand appliance market can be an important affordable option for lower income households to replace older or broken appliances. DHCD programs, including the Base Energy Efficiency program, offer no-cost appliance replacements for limited income customers—if they know about the program and have a streamlined opportunity for participation. Utilities should partner with DHCD to create more active engagement for limited income customers in need of appliance replacement. (This is a good example of opportunities for utilities to be more involved in driving participation in limited income programs, as described in more detail in the Limited Income Programs section below.)

Priority Appliance Recycling Recommendations for 2024-2026

EmPOWER utilities and DHCD should focus on specific program strategies for reducing the cost of new, high efficiency appliances to complement the recycling effort, to avoid an undue financial burden on low-income households.

HVAC

The HVAC program promotes heating and cooling technology for homes, including air conditioners, heat pumps, and gas furnaces and boilers, along with smart thermostats installed with HVAC measures. For most HVAC equipment, contractors and distributors are highly influential about the choice of equipment that customers have effective access to, whether due to stocking, installer knowledge, or other factors. Starting in 2018, HVAC programs largely transitioned to a midstream channel model, which targets incentives and engagement at equipment distributors and installation contractors. Although some residential retrofit projects include HVAC measures, the HVAC Program is the primary EmPOWER program for influencing replacement of heating and cooling equipment.

Space heating and cooling improvements make up over 70% of the opportunity for cost-effective GHG reduction in Maryland homes, but the HVAC Program currently represents only about 5% of EmPOWER GHG reductions.

2022 HVAC Performance

Despite forecasted growth in HVAC program savings in the 2021-2023 cycle, three of the five electric utilities achieved *roughly half or less* of the CTD savings forecast, continuing a trend from 2020 and 2021. A fourth utility, Pepco, is far enough behind (roughly 70% of CTD target) that it is highly unlikely to achieve its savings forecasts for the cycle. Only SMECO is close to being on track for program cycle savings targets.

The EmPOWER electric utilities report significant efforts to enroll new distributors and increase contractor engagement and fulfillment processes, with very modest results to date. Utilities cite the pandemic and associated supply and labor shortages as an ongoing drag on HVAC program performance. These utilities will need to urgently focus on increasing HVAC

program performance and trade ally participation to make meaningful progress towards achieving 2021-2023 cycle goals, and more fundamental changes are needed for 2024-2026.

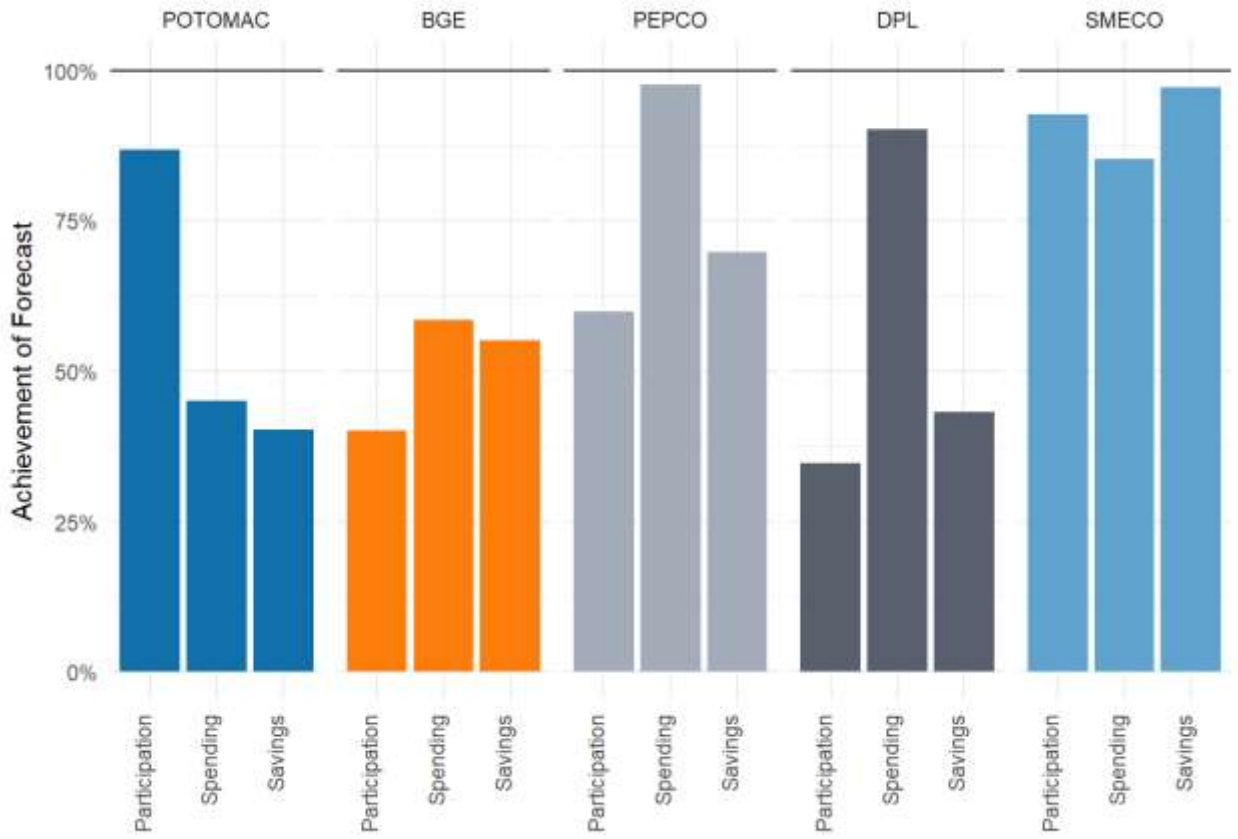


Figure 13: Cycle-to-Date HVAC achievement of forecasted electric goals.

The utilities reported progress with onboarding distributors, contractor engagement and sales promotions – including limited time offers. BGE made notable progress by increasing distributor participation by 33% in 2022, though significant effort must be made to realize participation gains during the current program cycle.

Three of the five electric utilities are achieving *roughly half or less* of the savings forecast. A fourth is only at 70%.

Table 6: 2022 HVAC Participating Distributors by Utility.

	BGE	Potomac	Pepco	DPL	SMECO
HVAC Distributors	28	19	21	21	15

Additional findings and analysis about the midstream program, including establishing effective partnerships and program implementation that works better for distributors and contractors, are found above in the Midstream Work Group section of this report.

EmPOWER electric utilities reported approximately 5,000 air source heat pumps (ASHPs) in the midstream HVAC program compared to 4,300 central air conditioners (CACs). However, ASHPs delivered over four-fold the energy savings to the program and customer households compared to CACs. Starting in 2024, utilities should end offering CAC rebates to focus on accelerating distributor sales of electric heat pumps, something several other jurisdictions have already done. BGE partially began this shift when they recently sought Commission approval to increase incentives for ASHPs but not CACs. This shift will be accentuated by the significant impact of the Inflation Reduction Act's federal tax credits and state pass-through funding targeted for midstream incentives for high efficiency heat pumps starting in 2023 and ramping up in 2024.

Central AC competes with heat pumps in the market, but heat pumps deliver more than four times the energy savings. Other jurisdictions have ended central AC incentives and EmPOWER should do so in 2024.

Recent market data on HVAC sales[27] in Maryland suggests that the EmPOWER midstream programs are influencing less than 31% of CAC and 14% of ASHP sales of higher efficiency equipment in the state. This highlights the need for urgent action for significant changes in the midstream program to be relevant in increasing heat pump adoption in the state. In addition, the significantly higher MWh savings opportunity and low market share for ASHP suggests that EmPOWER electric utilities should be focusing exclusively on heat pumps in the 2024-2026 cycle.

Table 7: 2021 EmPOWER HVAC Participation by Utility Compared to 2021 Maryland Sales Data.

	BGE	Potomac	Pepco	DPL	SMECO	EmPOWER	Maryland	Market Share
CAC Qty	2,487	284	1,314	61	160	4,306	13,828	31%
CAC MWh savings	950	104	421	15	75	1,565	5,026	
ASHP Qty	2,608	535	731	200	943	5,017	37,033	14%
ASHP MWh savings	3,365	615	806	211	1,315	6,312	46,592	

[27] HVAC sales data provided to the Midstream Working Group from Cometrics on 3/9/2023. Maryland sales data includes equipment <65 kBTU and with SEER >= 16,0.

Figure 15 shows annual HVAC electric savings for each utility. Most utilities are not on track to achieve even 2021 levels of savings, and 2022 is the lowest savings year in many years for most utilities. This downward trajectory is the exact opposite of what is needed to meet Maryland's climate policies and targets.

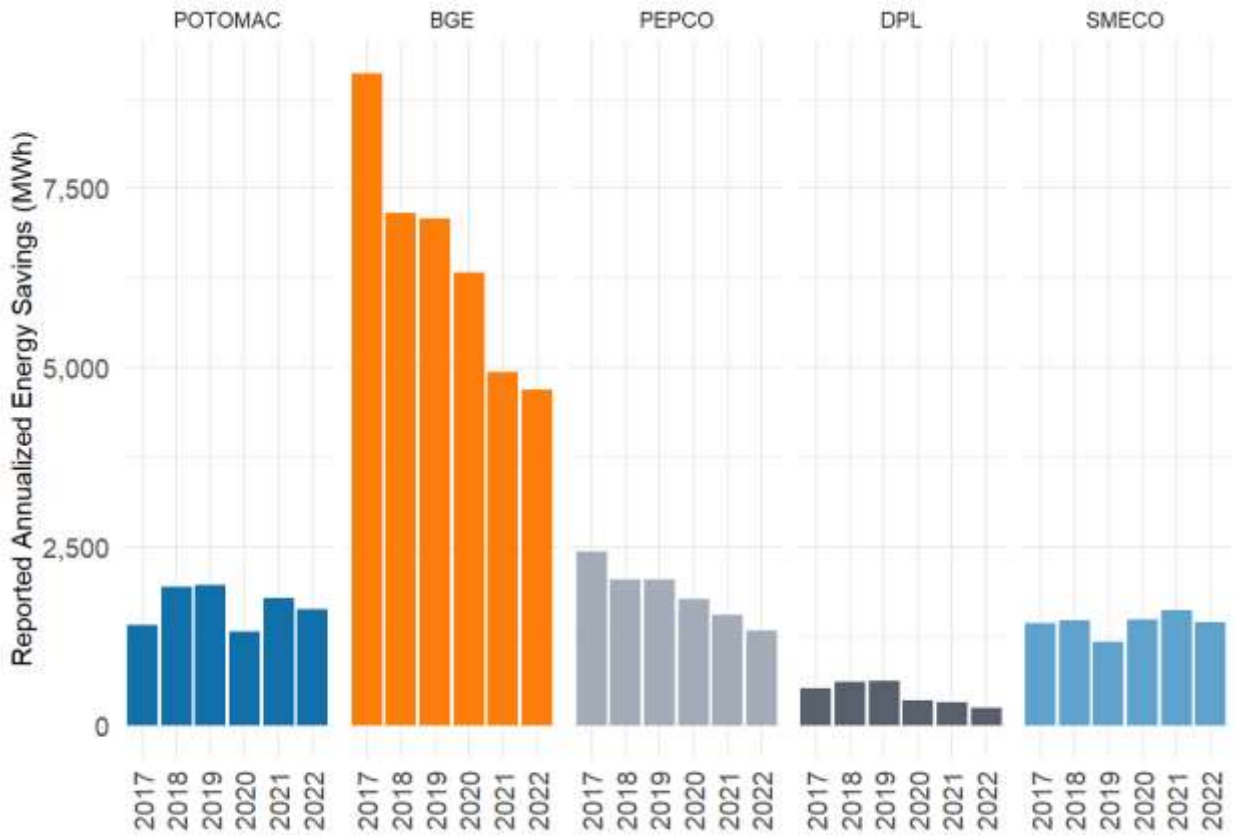


Figure 15: Reported annualized HVAC program savings by year.

BGE's CTD natural gas savings and its achievement of savings relative to the forecast are shown in Figure 16 below. Following similar performance in 2021, in 2022 BGE is achieving *less than 0.2% of forecasted gas savings* in HVAC. This result is astonishing and confounding. The Commission should direct BGE to explain what is happening and what remediation is planned.

In contrast to BGE, Washington Gas achieved roughly 100% of CTD forecasted therm savings from its HVAC program. Washington Gas introduced two new measures in the 2021-2023 program cycle—a furnace and boiler tune-up and a rebate for combination boilers (providing space and domestic water heating). The vast majority – over 90% - of WGL savings are from furnaces and energy conservation kits.

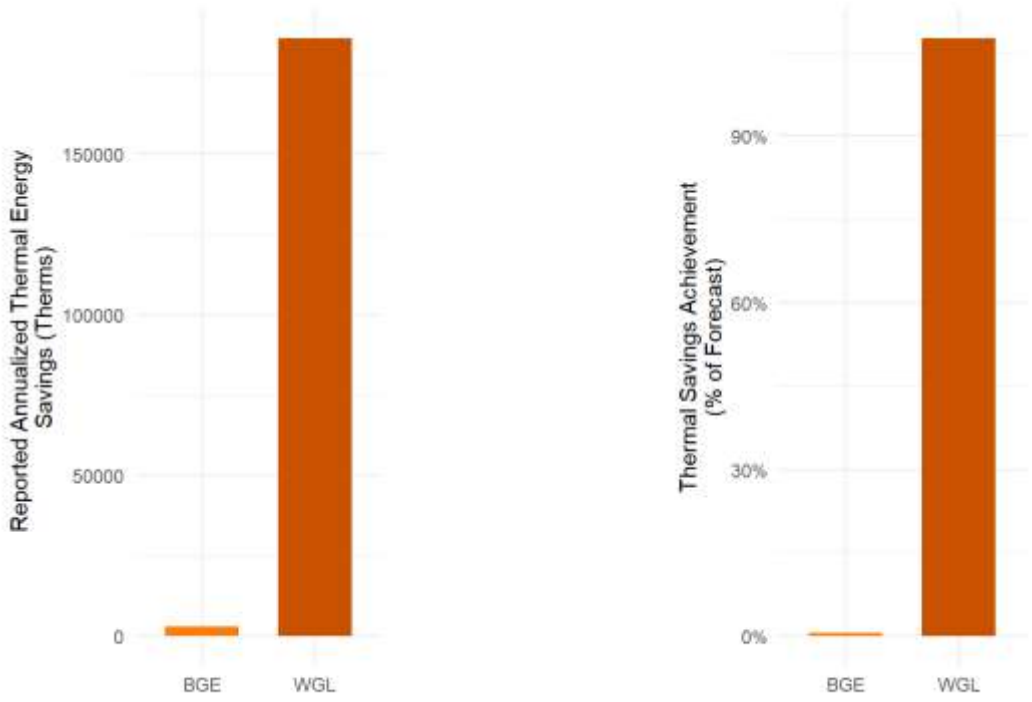


Figure 16: Cycle-to-Date HVAC program gas savings achievements.

Priority HVAC Recommendations for 2024-2026

The Commission should require the EmPOWER electric utilities to use a single implementer for midstream HVAC and HPWH in the next cycle. The failure to make meaningful program changes that engage the supply chain and drive participation is due in part to having five utilities (with three contracted implementers) with different program designs and implementation plans. The midstream program is special among EmPOWER programs because its primary target is not end-use customers but contractors and distributors that work across utility jurisdictions. Inconsistent market engagement is a major drag on program improvement, with distributors and contractors subject to differing requirements for data processing, customer communications, rebate processing, program fees, etc. The substantial effort utilities and their implementers report devoting to "alignment" could instead be devoted to bringing better programs to the market. Pending utility consideration and direction from the Commission, either one utility or one non-utility administrator could be designated as the contracting agent for a single implementer for this program. Other jurisdictions with multiple utility implementers (e.g. New York and California) sometimes designate a single utility for certain programs when doing so makes for more efficient market engagement.

A single implementer should implement a redesigned midstream program that is more focused on working within the business needs of distributors and contractors. The program must focus on rapid market transformation in order to meet state objectives for beneficial electrification of HVAC and water heating.

EmPOWER electric utilities should also end incentives for central air conditioners by the start of the next cycle, in connection with substantially greater effort to promote heat pumps for space conditioning.

Smart Thermostats

EmPOWER utilities achieve savings through the installation of advanced ("smart") thermostats with features that include seasonal or daily setpoint optimization. This product class provides some level of baseline structural efficiency while also providing demand response potential. (Demand Response programs are reviewed separately.) There are multiple programs through which customers can purchase or install smart thermostats. In addition, all of the electric utilities except for Potomac Edison also run a separate program generally described as "Thermostat Optimization". As a result, smart thermostats are used in multiple ways across the EmPOWER portfolio. Part of the purpose of this review is to examine those multiple channels and the degree of coordination among them.

2022 Smart Thermostat Performance

Smart thermostats have become a significant portion of EmPOWER utility program savings during the 2021-2023 cycle. Smart thermostat participation is now consistently reported by all utilities, identifying participation levels by program. However, there remain significant differences between utilities in forecasting and reporting on savings. Smart thermostats can represent a large portion of savings in some program channels, which include (1) direct installation through QHEC, (2) downstream and midstream rebates, (3) retail and online sales and (4) opt-in load management and optimization programs.

Table 8 below highlights the size of the retail channel in smart thermostat sales. Two of the five EmPOWER utilities – Pepco and SMECO - are significantly lagging behind 2021 smart thermostat participation trends and an evaluation of changes in program design and implementation is warranted.

Table 8. 2022 Smart Thermostat Participation by Program.

	BGE	Potomac	Pepco	DPL	SMECO	WGL
Total Sales	16,901	6,063	10,551	2,553	1,660	1,960
HVAC	2%	36%	4%	4%	5%	N/A
Home Retrofit	17%	0%	20%	21%	50%	N/A
New Homes	10%	20%	4%	6%	8%	100%
Retail*	71%	43%	72%	69%	37%	N/A
Demand Response**	310	N/A	0	0	0	N/A
Optimization	13,419	N/A	1,533	718	505	N/A

* Includes Marketplace/Online Store, Verified Instant, ESRPP, & traditional rebates
** Only refers to number of new thermostats installed, not DR program enrollments

Potomac Edison is also the only electric utility not offering thermostat optimization as an opt-in smart thermostat service. As smart thermostats offer a significant opportunity for achieving both direct HVAC energy efficiency and peak demand reduction savings, we recommend that Potomac Edison include thermostat optimization in 2024-2026 plans, based on the forthcoming evaluation required by the Commission.

Washington Gas included smart thermostat sales primarily through their partnership with SMECO in the New Construction program and should assess expansion through other channels and partnerships.

Priority Smart Thermostat Recommendations for 2024-2026

Smart thermostat products are being manufactured with an increasing number of features that support expanded integration into smart homes – including external sensors and smart speakers, as well as functionality to maximize load shifting away from peak periods. EmPOWER utilities should assess the impacts of these improvements to guide program design and savings attribution in the 2024-2026 cycle.

Potomac Edison should add thermostat optimization and SMECO and Pepco should assess program changes to recapture 2021 participation rates.

Residential Retrofit

The Residential Retrofit program group includes Quick Home Energy Check-up (QHEC), Home Performance with Energy Star (HPwES) and SMECO's Home Energy Improvement Program (HEIP) which combines elements of the two other programs offered by the other electric utilities. Washington Gas supports residential retrofits through its Coordinated Program, through which WGL and electric utilities share costs and savings in homes with electric and gas savings. The residential retrofit programs are distinct from most other EmPOWER programs in that they employ a "whole home" (vs. technology specific) approach.

For more explanation of the Residential Retrofit programs, please see **EmPOWER Program Descriptions** at the beginning of these comments.

2022 Residential Retrofit Performance

QHEC

There continues to be significant variations in savings per participants across utilities, which correlates with a utility's ability to meet its energy saving goals. BGE did not meet its participation goals but exceeded its energy saving goals because savings per participant were high. The opposite is true for Potomac Edison, which substantially exceeded the number of forecasted participants but notes that the "average in-home QHEC savings per audit for 2022 were only 61% of the Plan average assumption"[28].

[28] Potomac Edison 2022 Q3-Q4 Semi-Annual Report 2-14-2023, p.20

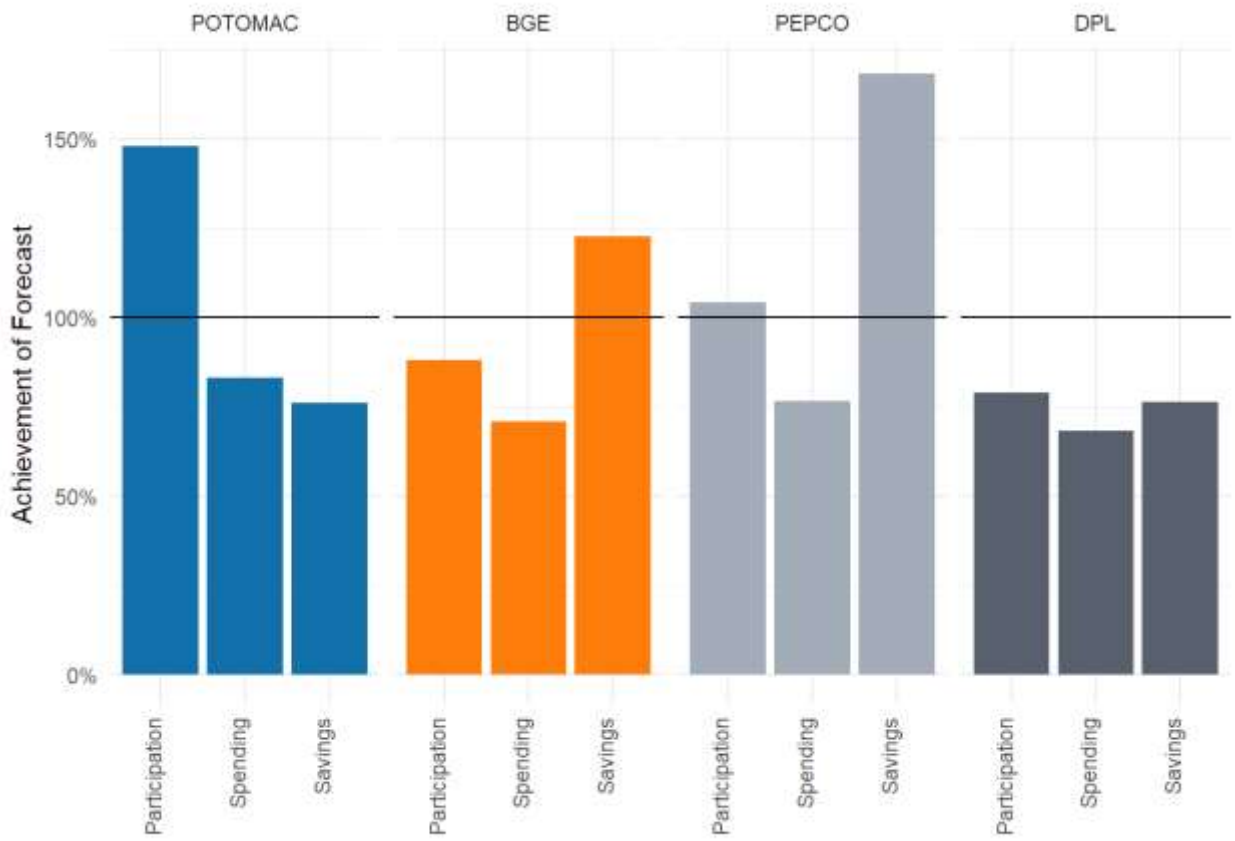


Figure 17 Cycle-to-Date QHEC achievement of forecasted electric goals.

Variations in savings per participant are shown in figure 18 below and correlate with:

- The average number of measures installed (from 5 measures installed on average in Potomac Edison service territory to 14 measures on average in Pepco service territory)
- The type of measures installed and available as part of a utility QHEC offering

The most frequently installed measures in QHEC are smart power strips, LEDs, and efficient flow showerheads.

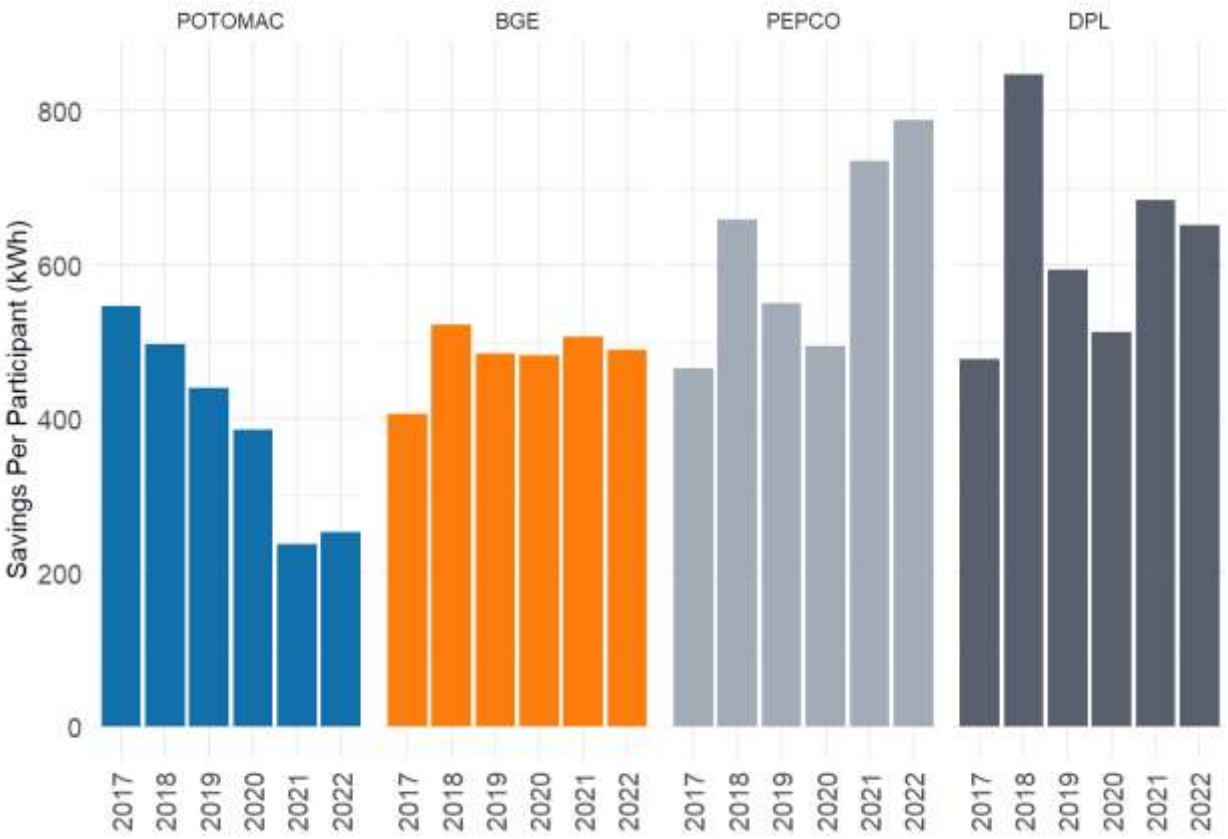


Figure 18: Total energy savings per participant, QHEC

Finally, while some EmPOWER utilities continue to offer a virtual check-up option the majority of QHECs are delivered in-person, in accordance with ratepayers' preference.

HPwES & HEIP

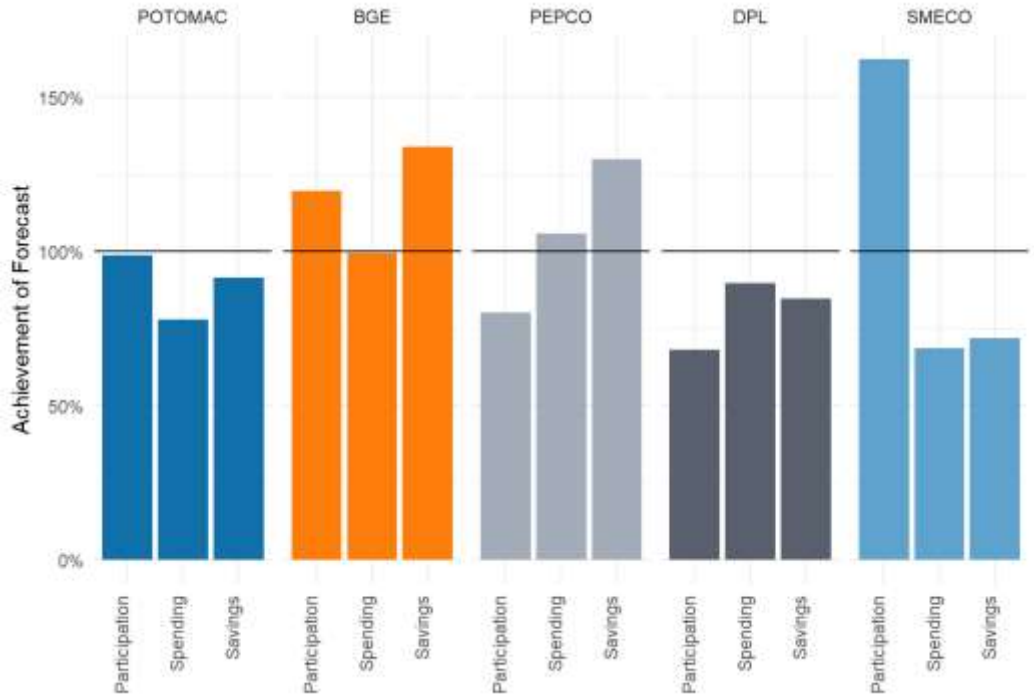


Figure 18: Cycle-to-Date HPwES and HEIP (SMECO) achievement of forecasted electric goals.

Because smaller direct installation measures are offered to participants during the audit, participation in HPwES delivers immediate savings regardless of whether a job is "completed". However, most savings result from the adoption of weatherization measures post-audit. HPwES' success in triggering participants' adoption of weatherization—and possibly HVAC—measures depends on its capacity to capitalize on the educational value of the audit, financial attractiveness of incentives in comparison to savings and project costs, and overcoming a host of intangible barriers to finding and working with construction contractors. Hence, differences in saving achievement are correlated with variations in participation volumes, job conversion rate, and the scope of measures program participants pursue post-audit.

Pepco's ratio of completed jobs to audits is six times higher than that of SMECO in this cycle to date. Other utilities fall in between.

Figure 20 below shows a significant variation in the audit/job completed ratio. While this ratio is significantly lower for SMECO's HEIP, SMECO notes a 46% increase from 2021 in terms of number of jobs completed[29], demonstrating an untapped potential for further savings.

[29] SMECO 2022 Q3-Q4 Semi-Annual Report 2-15-2023, p.7

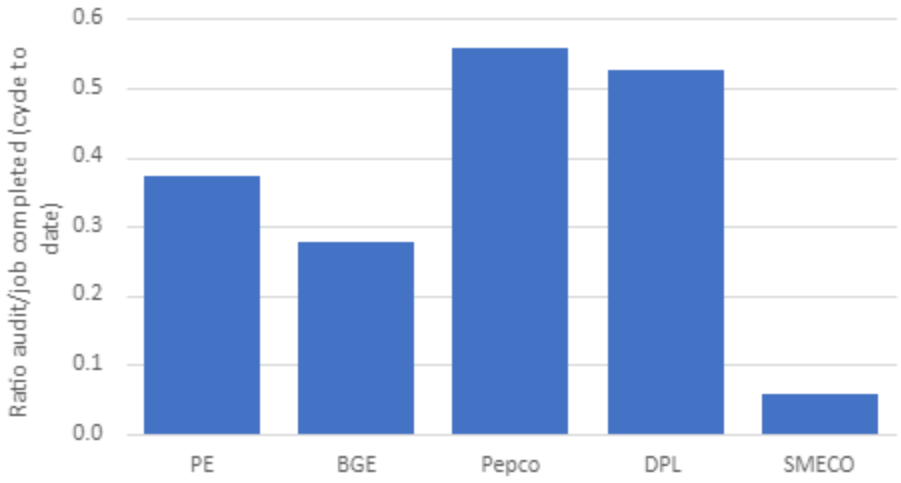


Figure 20: Radio of completed jobs to audits within HPwES and HEIP, CTD.

Figure 21 below shows the annualized energy savings per participants (both gas and electric, in MMBtu) for completed HPwES projects and highlights variation in project scope. As an example, BGE notes that "by promoting deep energy retrofits, customers have taken advantage of the program rebate structure by including high efficiency HVAC systems and heat pump water heater upgrades in their jobs. In 2022, customers have bundled 329 equipment measures with insulation improvements that include 191 high efficiency heat pumps and central air conditioners as well as 131 heat pump water heaters"[30]. While Delmarva Power did not meet its participation and saving forecast, it delivers the highest energy saving impact per participant completing a project.

[30] BGE 2022 Q3-Q4 Semi-Annual Report 2-16-2023, p.18

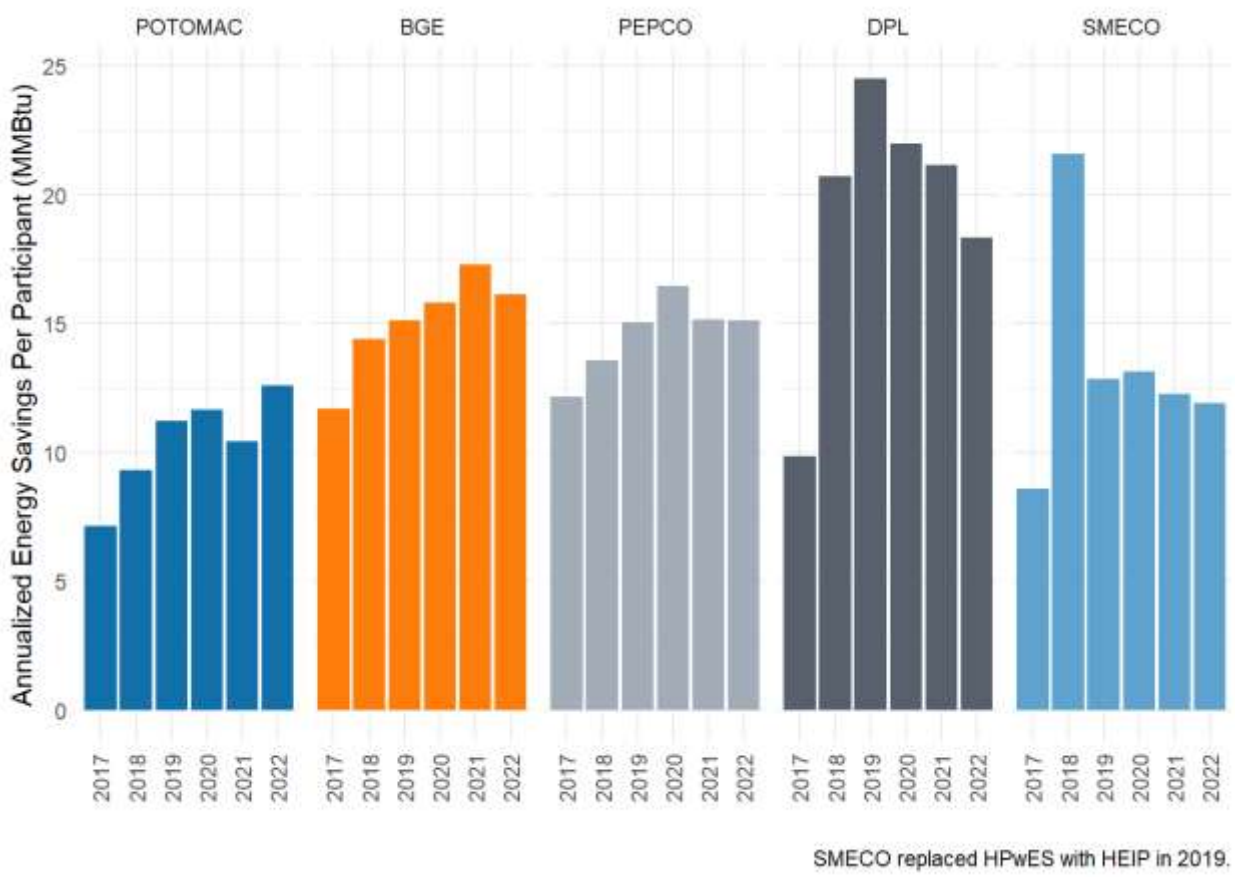


Figure 21: Total energy savings per participant for HPwES & HEIP completed jobs

Income-eligible ratepayers' participation in utilities' retrofit programs

QHEC is comparable in scope (i.e., a home assessment followed by direct installation measures) to DHCD's base efficiency program (see "Limited Income – DHCD" section). Figure 22 shows that while income-eligible programs are traditionally described as "DHCD programs", income-eligible ratepayers participated in the QHEC program at a rate three times higher than in the DHCD-run base efficiency offering. (The number of income-eligible participants in QHEC is a conservative estimate because it is very likely there are income-eligible participants who are not identified by utilities as such.[31])

[31] Households are identified by the EmPOWER utilities as "income-eligible" when receiving energy assistance via the Office of Home Energy Programs. Historically, only one third of eligible households apply to energy assistance. (See 2022FY - Operating Budget Analysis - N00I0006 - DHS Office of Home Energy Programs (maryland.gov))

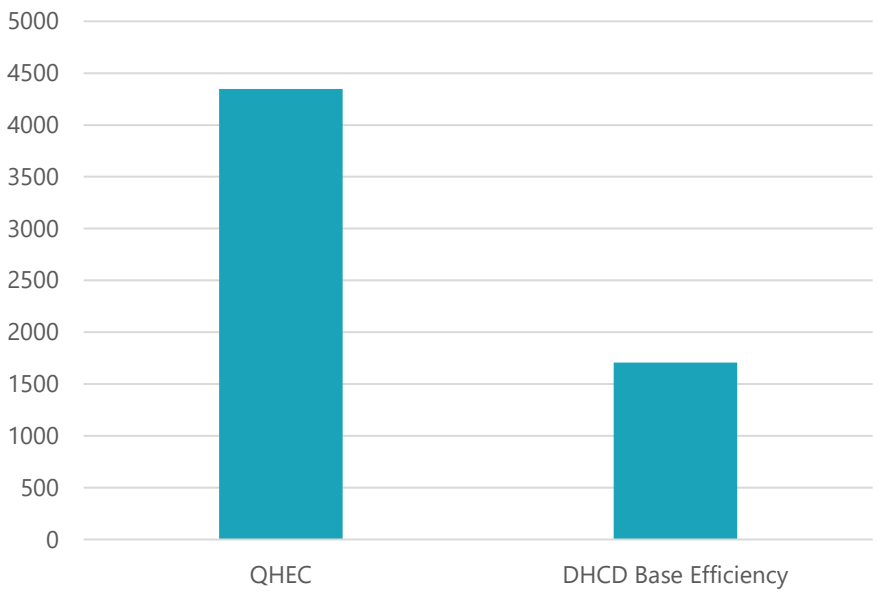


Figure 22: Number of identified income-eligible participants in QHEC and DHCD Base Efficiency programs, Cycle-to-Date

This trend should be discussed by the low-income working group and corrected for several reasons. First as shown by figure 23 below, participation in the DHCD base efficiency program delivers close to three times more energy savings to eligible ratepayers than QHEC. In addition, given its scale the participation of income-eligible households in QHEC is likely to "crowd-out" participation in DHCD-run programs and be a barrier to enrollment in the whole-home program, which should be the priority for eligible ratepayers whenever possible.

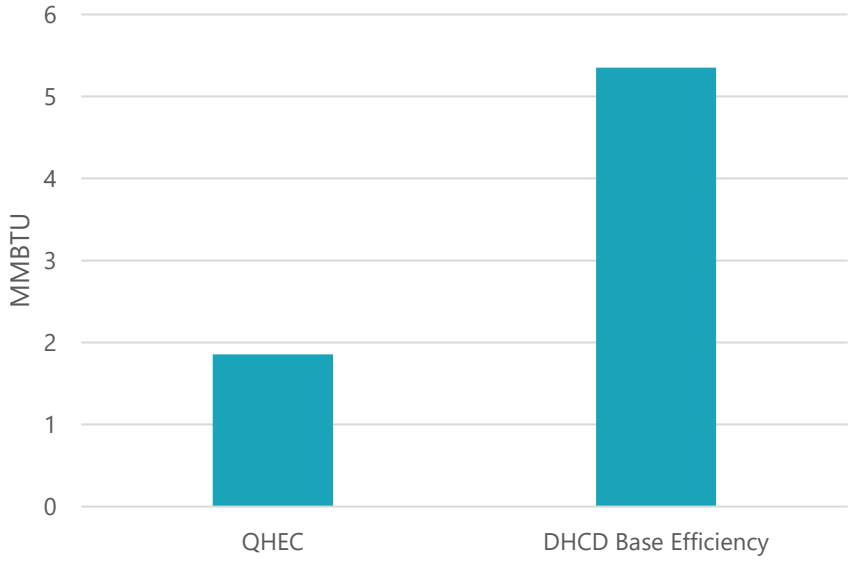


Figure 23: Savings per participants in QHEC and DHCD Base Efficiency programs, CTD

Households with limited incomes identified as income-eligible in a utility's database should not be enrolled in HPwES. Regardless of income level, a HPwES audit costs $100 to participating ratepayers. Participants also pay a minimum of 25% of measures installed post-audit. Finally, income-eligible participants should not be directed to financing products when DHCD programming offers similar measures free of charge. Hence, income-eligible households' participation in HPwES places preventable financial cost on households who may be struggling with basic living expenses. Instead, customers identified as income-eligible should be referred to DHCD programs from the outset.

Priority Recommendations for 2024-2026

Retrofit programs should actively encourage and pursue electrification. Given the "customer education" value of QHEC walk-through and HPwES audits, as well as associated reports, retrofit programs are an important point of entry toward electrification for numerous Marylanders. Hence, as EmPOWER moves toward GHG reduction goals:

- QHEC and HPwES should assess homes for electrification readiness
- HPwES incentive structure and measures should be adjusted to include electrification retrofits (and not include incentives for new gas-burning appliances)
- The retrofit programs should be seamlessly integrated with IRA incentives

Income-qualified ratepayers' participation in QHEC and HPwES demonstrates the utilities' significant capacity to enroll Marylanders living with low and limited income in EmPOWER programs. As discussed in the "Limited Income -DHCD" section, utilities should be held accountable to driving enrollment toward *DHCD* programs for income-eligible ratepayers.

For ratepayers identified as income-eligible in their database, the utilities must prioritize enrollment in DHCD run programs over enrollment in their own programs.

Behavior

The EmPOWER Behavior programs save energy by providing insights to customers through printed and emailed home energy reports (HERs), digital tools, and messaging to customers. These tools leverage advanced meter infrastructure (AMI) data to influence energy saving behavioral changes by customers (compared statistically to non-targeted customers). Energy savings accrue as end-users adopt behaviors recommended in the reports based on usage patterns and historical trends. In EmPOWER, savings from behavior programs are assumed to last for a single year, and savings are measured in statistical comparisons between participants and control groups of like customers.

Behavior programs are among the most productive and cost-effective in the portfolio, especially when measuring savings on an annual basis.

2022 Behavior Performance

Most utilities continue to report successful deployment of programs that provide energy-related information and now, with the more widely deployed AMI, customized user insights. By measuring program results in terms of energy savings, engagement, and program participation, utilities are able to offer behavior-based programs cost-effectively to nearly the whole population. The electric utilities' high level of participation—excluding the retained control group used to measure how energy use changed as a result of the intervention—has emerged as a program best practice that combines mass-marketing with energy savings.

Behavior programs performed close to expectations for the 2022 Q3-Q4 semiannual period and 2022 program year. Participation rates remain high and meeting forecast cycle-to-date. In total, more than 1.7 million Maryland residents have been enrolled in a behavioral

program in this semiannual period. The percentage of customers enrolled in behavioral programs offered by EmPOWER utilities is broken down in figure 24 below.

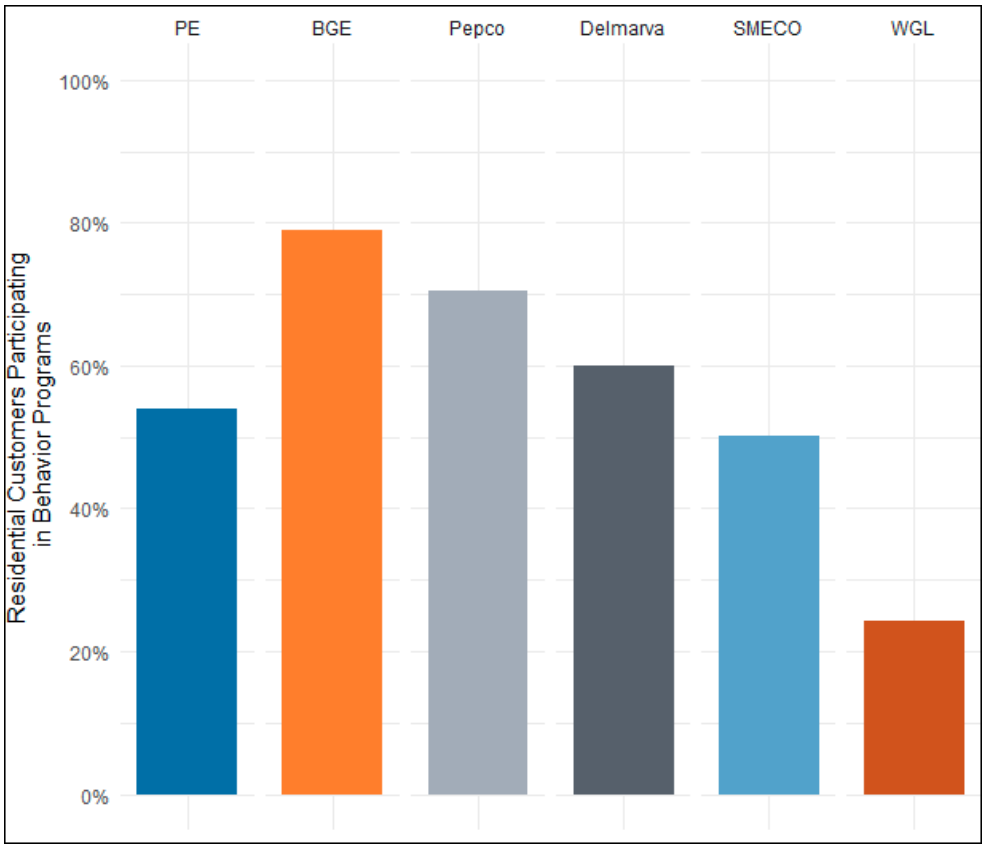


Figure 24: Share of utility customers participating in behavioral programs, CTD.

For the most part, utilities are performing well relative to cycle-to-date participation, spending, and savings forecasts, as shown in Figure 25. Delmarva and Pepco both have exceeded forecasted electricity savings to date, with savings per participant exceeding forecasts at the cost of some increased spending. Potomac Edison and SEMCO have come very close to forecast, due to somewhat lower than expected savings per participant. BGE exhibits a similar pattern but is somewhat further behind at around 80% of savings.

Across the board behavioral programs have proven to be cost-effective and highly productive. Behavioral programs account for anywhere between 23-46% of residential portfolio annual savings across all EmPOWER utilities, yet do not exceed more than 9% of spending. Moreover, utilities are spending within program budgets even while introducing new innovations and strategies during this program cycle.

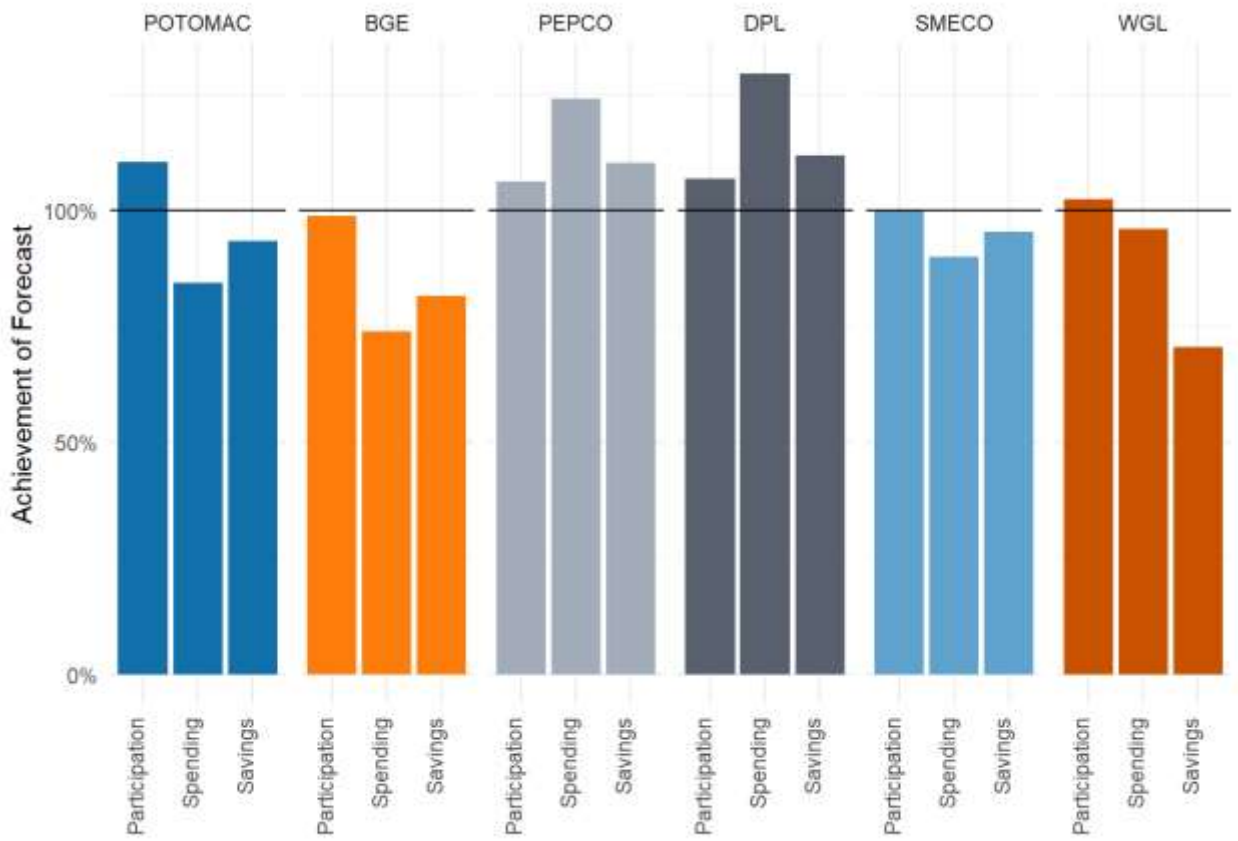


Figure 25: CTD Achievement of forecast for behavioral programs.

Behavioral gas programs, however, have proven to be less successful in achieving forecasted savings. BGE, though relatively successful with electricity, has only met 34% of forecasted therms savings, while Washington Gas has thus far met 47% of the cycle-to-date forecasted savings. Given that gas usage comes predominantly from space heating, water heating, and cooking, some behavioral strategies that are successful in reducing electricity usage may not directly translate or be applicable to gas savings. BGE and WGL noted alternative strategies for behaviors that specifically drive gas savings in their reports; these need to be accelerated in the future. For example, customers can often be prompted to reduce their water heater temperature setting slightly for energy savings with no loss in comfort (or even improved comfort). They can also include (at least for BGE) behavioral initiatives to drive customers toward electrification.

While almost all electric behavior programs are performing near or above forecasted savings, the gas behavior programs are achieving less than half.

Over the past several years, the utilities have been developing more diverse and integrated demand-side management programs. One example is the analysis of patterns in AMI data to detect different types of energy uses (called "disaggregation") and target the content in HERs to promote other efficiency programs most likely to help that customer segment. We are encouraged to see this advancement in the utilities' ability to utilize AMI infrastructure to

unlock additional energy savings and demand response opportunities for customers and we look forward to seeing new use cases and value for customers from this investment in AMI, including more comprehensive and targeted DR offerings. EmPOWER utilities are already utilizing this data to innovate and drive further savings. During this period, for example, BGE launched a new campaign using insights from AMI disaggregation to identify customers that owned an electric vehicle (EV), with an 87% success rate. Delmarva and Pepco also tested their own EV confirmation campaigns. Combining behavioral insights and disaggregated data has significant potential to improve program offerings to customers, increasing the savings potential and satisfaction that ratepayers gain from the EmPOWER program.

Many utilities tested strategies in 2022 to better serve low and moderate income (LMI) customers and promote additional programs offerings. BGE, Delmarva, and Pepco piloted weekly usage reports to LMI customers that included information on spend to date, forecasted spend, and actions required to apply to the Maryland Energy Assistance Program. BGE reported 100,000 customers will participate in a randomized control trial pilot measuring uplift into the energy assistance program, call center volume, and customer satisfaction.

We are encouraged to see utilities employing segmentation strategies to assist their customers as behavioral engagements can differ drastically depending on customer demographics. LMI customers, for example, are often already taking actions to reduce their consumption or forgoing other necessities in order to afford their energy bills. Though education through behavioral programs does provide some benefits, more benefits can be delivered to LMI customers by connecting them with supportive programs such as those offered through DHCD. Weatherization alone could reduce low-income energy burden by as much as 25%[32], yet we know awareness of DHCD programs falls far short of the potential. This cross-promotion would be more likely to become a utility priority if it was measured and rewarded through some metric. Although the Commission has decided not to assign utilities any LI savings goals, our recommendation for a utility goal concerning participation in DHCD programs (described in the Low Income section) would help utilities justify the effort and potential costs.

[32] Drehobl, Ross & Ayala (2020). How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burden across the United States. ACEEE. https://www.aceee.org/sites/default/files/pdfs/u2006.pdf

Priority Behavior Recommendations for 2024-2026

Delivering information with data from AMI will be imperative to the success and expansion of behavioral programs. Recent advances in disaggregated insights provide greater understanding of how behavioral programs save energy and have demonstrated success in increasing participant engagement and satisfaction with HERs programs. Utilities can leverage this data to provide relevant information to end-users and potentially attribute greenhouse gas savings to specific actions. Moreover, disaggregation has become more widely available through statistical analysis and other means that circumvent the need to have a monitoring device installed in customers' homes. This will be an opportune area for EmPOWER utilities to explore and provide clarity to evaluators on the level of savings utilities may claim from behavioral programs, persistence of savings, and spillover into other EmPOWER offerings.

Behavior-based programs should be used to facilitate and promote electrification efforts, guiding customers into appropriate programs through methods already employed by home energy reports. This should be done in conjunction with targeting low-income customers to connect them to programs for which they may be eligible. Utilities should track the spillover of customers from the behavioral programs into other programs to assess the effectiveness of strategies and identify areas of improvement. Serving as an "on-ramp" for other programs should not detract from the cost effectiveness of behavioral programs.

New Construction

The EmPOWER incentive program for residential new construction is based on the national ENERGY STAR® program and is referred to by the utilities as ENERGY STAR for New Homes. The basic program and incentive structure target whole home energy performance. Homes that earn the ENERGY STAR label are estimated to be at least 10% more energy efficient than the prevailing energy code and are backed by established national quality standards. In the current program cycle, utilities have begun offering specific incentives for additional measures (high efficiency heating, cooling, and water heating equipment), as well as an option to certify to U.S. DOE's Zero Energy Ready Homes (ZERH).

EmPOWER utilities have provided a consistently successful ENERGY STAR new homes program since 2012, maintaining an average of 30% market share. It is past time to build on this success and take builders to the next level to construct low-energy, all-electric homes with loads that can be offset by renewable energy.

2022 New Construction Performance

Two-thirds of the way through the 2021-2023 program cycle, program performance remains relatively steady. Three electric utilities and Washington Gas have met or exceeded savings targets, with BGE and PEPCO below target. Maryland's largest two utilities continue to cite post-pandemic challenges including supply chain issues, labor shortages and fluctuating mortgage rates, all of which have impacted the ability to meet savings goals. BGE, however, was the only utility to fall short of its participation and savings goals. (Washington Gas also did not meet participation goals, but far exceeded savings targets through high reported savings per participant.) Figure 26 illustrates the Residential New Construction (RNC)

program performance across the utilities cycle-to-date performance metrics for participation, spending and savings.

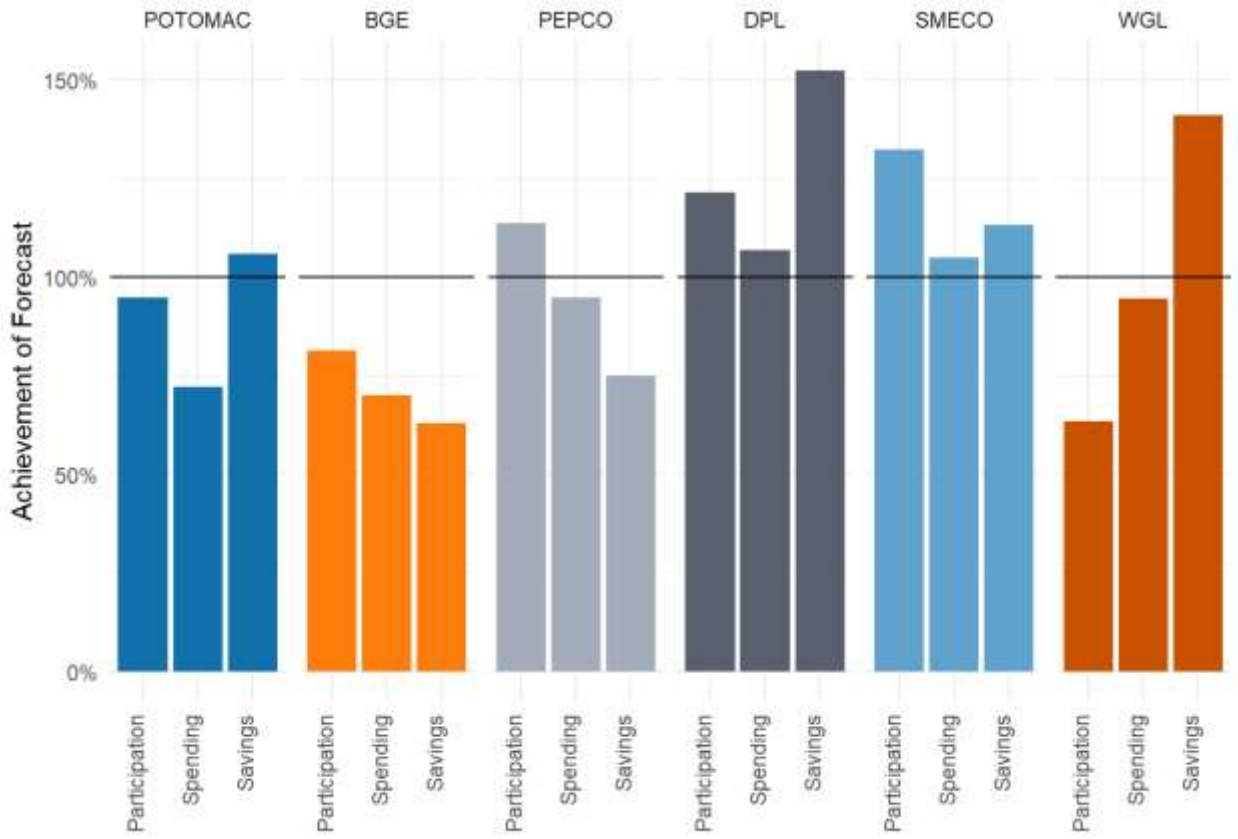


Figure 26. Cycle-to-Date Residential New Construction program achievement of forecasted goals.

Washington Gas has cited its RNC program as the strongest performing program in its portfolio throughout this program cycle and continues to benefit enormously from the coordinated program with electric utilities. Washington Gas continues to report the 95.1%+ AFUE furnace as the most popular measure in this program. This underscores the need for more, and higher, incentives directed toward heat pump technologies in the electric utility program if Maryland hopes to encourage electrification and GHG reduction through its EmPOWER utility programs.

Washington Gas's high achievement of savings in the New Construction program illustrates the need to tackle the issue of gas equipment incentives soon for the next planning cycle. Incentives for gas equipment in new homes lock in gas usage for decades to come, to the long-term detriment of customers. Even if there are incremental gas efficiency gains in the short term, incentives for gas equipment in new construction are inconsistent with the goals set forth in the Climate Solutions Now Act of 2022. The Maryland Commission on Climate Change's (MCCC) most recent study found that the least-cost path for residential customers

is electrification, especially in new construction.[33] New construction presents a prime opportunity for the Commission to align EmPOWER program policy with the State's statutory short and long-term greenhouse gas reduction goals. Utilities should use the coming months to improve and prepare to accelerate their strategies for capturing gas savings without promoting gas equipment.

Utility reporting of additive measures and participation in the Zero Energy Ready Homes certification remain inconsistent.[34] This lack of consistent and transparent reporting makes it difficult to assess true participation rates and impacts on savings of these new measures. Table 9 presents the total quantity of new additive measures and ZERH program participation as reported by utilities, as well as each measure as a percent of all program participants. (Note that the reporting values for Pepco and DPL are unclear for this current filing period.) It is clear from these numbers that the utilities have significant opportunity to grow this offering.

Table 9. EmPOWER Electric Utility Participation in New Additive Measures and Program Tiers Program CTD

	Potomac	BGE	Pepco	DPL	SMECO	% of Total Participants
NEW Additive Measures						
Heat Pump Water Heater	164	85	16	-	124	4%
ENERGY STAR Air Conditioner	24	215	6	-	2	2%
ENERGY STAR Air Source Heat Pump	-	69	-	-	-	<1%
Zero Energy Ready Homes	-	5	1	-	-	<1%

The measure with the most significant uptake continues to be heat pump water heaters, and BGE continues to be the only utility to report installation of Air Source Heat Pumps. This data underscores the relatively slow pace of heat pump adoption within EmPOWER, a function of incentive structures that are not designed to induce fuel-switching. In contrast, it appears that nearly 100% of Washington Gas participants install high efficiency gas and water heater measures.

Fewer than 10% of participating homes have installed "additive measures" (e.g. heat pump water heater) and less than 1% have certified to Zero Energy Ready Homes.

[33] Maryland Commission on Climate Change, Building Energy Transition Plan: A Roadmap for Decarbonizing the Residential and Commercial Building Sectors in Maryland, 4 (November 2021). https://mde.maryland.gov/programs/air/ClimateChange/MCCC/Commission/Building%20Energy%20Transition%20Plan%20-%20MCCC%20approved.pdf

[34] Some utilities include the number of additive measures in the RNC reporting table, while others just include information in the filing narrative, or simply a total number of measures installed without identifying which measures specifically. Consistent RNC reporting should be improved ahead of the next cycle.

Without a common baseline, it is difficult to discern whether differences in performance on goals merely reflects how aggressive each utility's goals are. Market share, or market penetration, is a good indicator of the acceptance of a program or product by the target audience. It can also indicate whether potential customers are responsive to marketing tactics and new initiatives being deployed. SMECO has been the only EmPOWER utility to report this metric for several cycles. We recommend that the utilities report market penetration for their programs in the next cycle. Additionally, creating goals for additive measures and ZERH (or higher) tier participation and consistent reporting is critical to understanding how Maryland's new homes market is, or is not, making progress toward the state's climate goals. Measure reporting will also help gauge impact on utility savings. For example, BGE's Tier 4 (Single-family detached) homes realized nearly 10% greater average kWh savings/home since the 2021 Q3/4 period when the utility started reporting additive measures. However, it is not possible to directly compare savings per home of participants with and without additive measures.

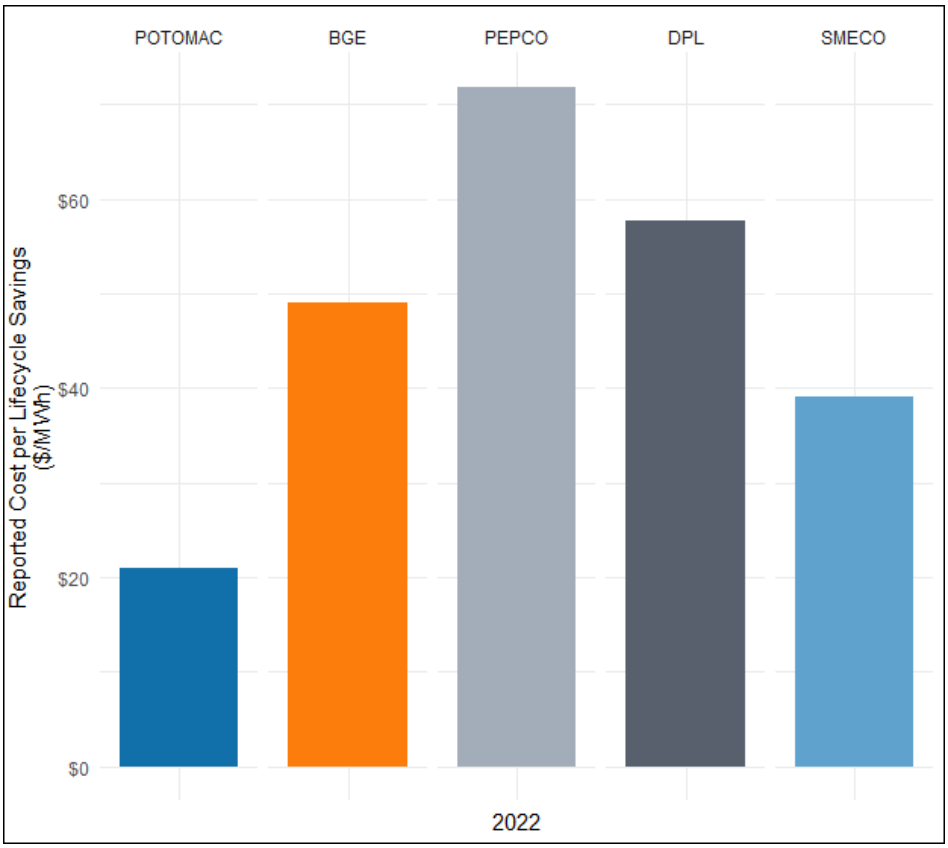


Figure 27. 2022 reported cost per MWh of savings for residential new construction.

Priority New Construction Recommendations for 2024-2026

It is clear from the 2021-2023 program cycle performance to date that the utilities continue to operate at status quo and that a significant level of effort needs to be focused on high efficiency electric technologies, specifically heat pumps for space conditioning and water heating, in the coming cycle. The 2024-2026 program cycle should be incentivizing homes that are, at a minimum, electric- and net zero- ready. VEIC has been recommending higher program tiers for over ten years. There are many national and local program examples to draw from. In addition to the latest, and more efficient, ENERGY STAR and ZERH program tiers, ENERGY STAR's Next Gen certification has been newly released in 2023. While the certification does not preclude fossil-fuel use, it does require that primary heating systems be electric and includes requirements for heat pump water heating, induction cooking and EV readiness. This certification should be incentivized in the next program cycle. Many utility programs already offer all-electric incentive adders, including Massachusetts, Connecticut, and Vermont.

In the coming program cycle, priorities for the EmPOWER utilities should include:

- Implementing the highest tier of national ENERGY STAR and ZERH programs.
- Add training, support, and incentives for Phius CORE and Phius ZERO certification[35] - at minimum for multifamily construction which has many examples of cost-parity with code construction.
- Adjust incentive levels to provide significantly higher incentives for above-ENERGY STAR performance and the greatest incentives for all-electric and zero-ready construction.

VEIC recommends that the EmPOWER utilities move to implement ENERGY STAR v3.2 and ZERH v2.0 as standard program tiers and offer ENERGY STAR Next Gen as an additional certification. Additionally, we encourage the EmPOWER utilities to review the new Phius 2021 standards and consider offering incentives for this higher level of performance. Phius updated its program standards in 2021 and now offers both a performance and a prescriptive path for certification. Two levels of certification may be attained – Phius CORE, which allows onsite fossil fuels, and Phius Zero, which does not. In addition to offering higher standard program tiers, the utilities will want to set target goals for the higher tiers and achievement of all-electric construction. Implementing these more stringent standards will also help ensure homes are eligible for the new 45L tax credit under the Inflation Reduction Act (IRA).

In addition to the above programmatic changes discussed above, VEIC strongly recommends the utilities prioritize the following in the next program cycle:

[35] Phius (derived from "passive house") is an internationally-recognized standard for low emission/low-impact construction.

- Consistent measure-level and program tier participation reporting
- Market penetration rate reporting
- Prior to the start of the next program cycle, establish a focus group to identify specific barriers to adoption of heat pump technologies for space conditioning and hot water.

Limited Income - DHCD

The Maryland Department of Housing and Community Development (DHCD) programs serve both single family and multifamily markets. Eligibility is limited to customers who have household incomes less than 250% of the Federal Poverty Level. Although participation in DHCD programs has no direct cost to participants, identifying eligible customers and engaging and supporting them to participate in programs is an enormous and complex task. For the single-family segment, a comprehensive suite of programs targets customers at different stages of their journey toward energy efficiency, based on specific barriers to participation. Both single and multifamily participants may receive an energy efficiency kit with small, self-installed efficiency measures. DHCD also runs the Multifamily Energy Efficiency and Housing Affordability Program (MEEHA) to generate deep energy savings in building in which at least 20% of household have incomes below 80% of the average median income (AMI)[36]. (See the **EmPOWER Program Description** section above for more explanation about DHCD program design.)

DHCD run programs served 2 percent of eligible households in 2022. When the distribution of energy kits is excluded, only 0.8 percent of eligible households participated in DHCD run programs in 2022.

[36] https://dhcd.maryland.gov/HousingDevelopment/Pages/EnergyEfficiencyWeatherization.aspx

2022 DHCD Performance

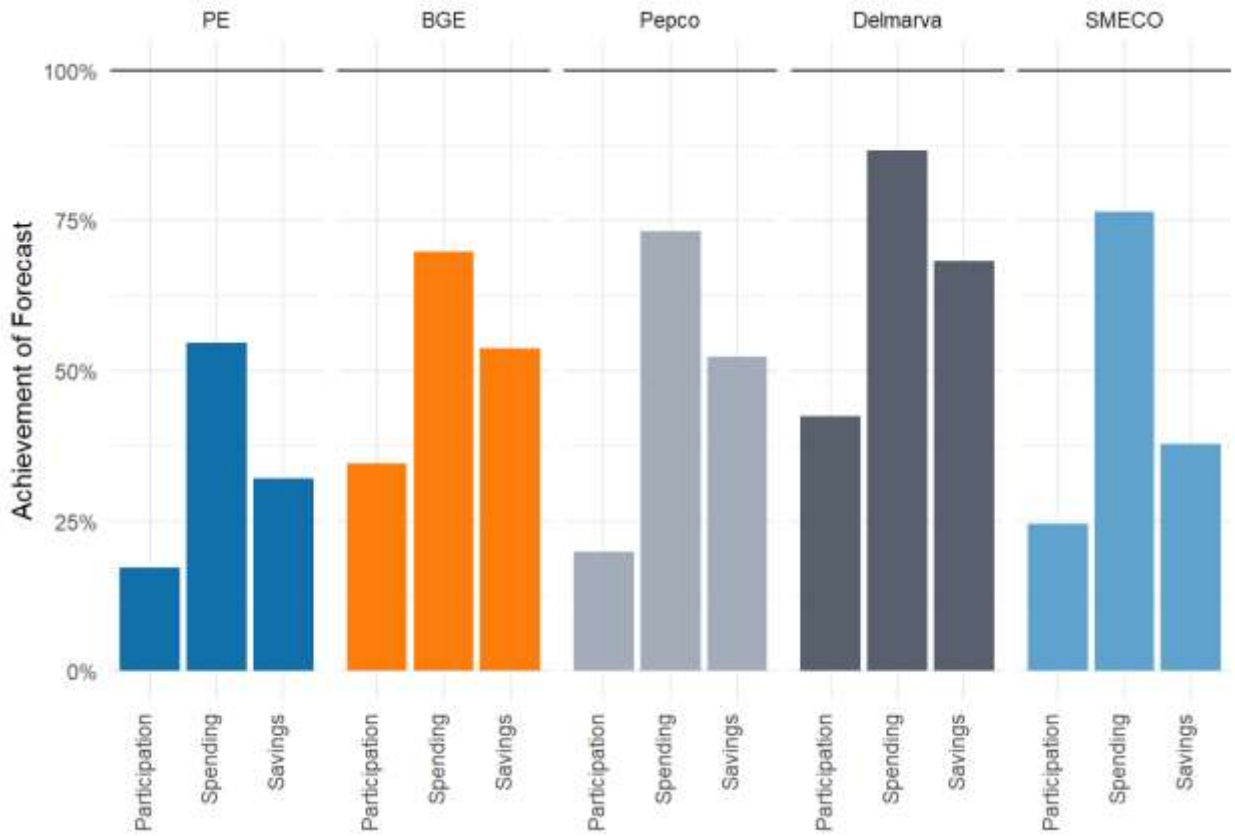


Figure 28: Achievement of Forecast - All DHCD EmPOWER Programs

Single family

Energy savings per participant continue to trend higher than forecasted. Per figure 29 below electrical energy savings for the current program cycle continue to significantly exceed energy savings per participants reported in the previous 2018-2020 program cycle. A slight decrease in energy saving per participant is observed between 2021 and 2022 (except for Pepco).

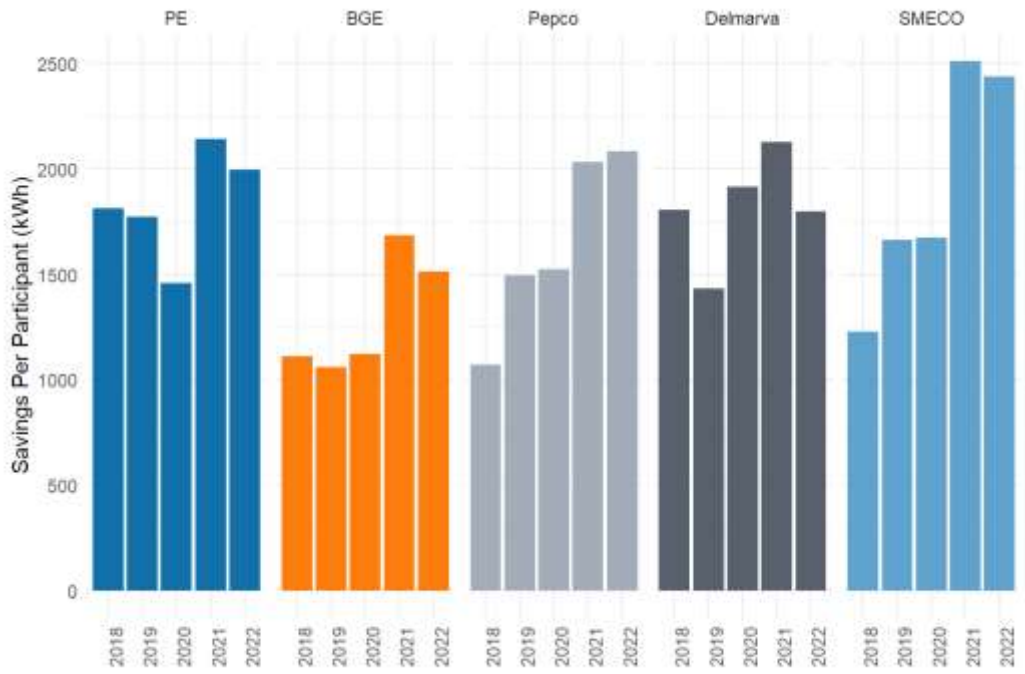


Figure 29: Base Efficiency and Whole Home Efficiency Programs – Annual Average KWh Savings per Participant

DHCD continues to report delays and material shortages as participation level is behind forecast. However, as DHCD's energy kit program ramps up[37] participation is starting to catch up with forecast.

DHCD notes a significant drop in leads received from the Office of Home Energy Programs (OHEP)[38]. While DHCD does not elaborate on the factors driving this decrease in its latest report, we expect this trend to continue.[39] Yet, OPC commends DHCD's training of 600 Department of Human Services (DHS) employees on EmPOWER: ensuring a smooth hand off between DHS' OHEP and DHCD remains a critical opportunity for improvement. OPC also supports DHCD's request to add categorical eligibility for Maryland Energy Administration (MEA) LMI Program participants. As Maryland moves toward electrification and explores how to best deploy Inflation Reduction Act funding greater coordination between state-run programs will be critical.

DHCD will need to shift from a customer acquisition model focused on enrolling OHEP's applicants toward a multi-faceted engagement strategy tailored to the specific barriers of

[37] 3418 kits were sent during Q3-Q4 2022 per DHCD Semi-Annual Report.
[38] DHCD 2022 Q3-Q4 Semi-Annual Report 2-15-2023, p. 6
[39] In its 2021-2023 EmPOWER Plan (ML 231674) DHCD notes that "more and more applicants have received some form of prior energy efficiency work" (p. 29) and that "many of the homeowners that are aware of program opportunities and care about home improvement have already participated" (p. 30). This trend combines with a rate of repeat applications for energy assistance of 75% in FY 2019 (at p. 29).

hard-to-reach-customers. Barriers to participation are poorly understood in the Maryland context and may include medical issues, language, internet access, fear of engaging with one's landlord, lack of trust in State or utility run programs, tenant/landlord split incentive, as well as the need for major repairs.

In addition, to be effective DHCD outreach must be geographically targeted and adapted to a segment that is inherently diverse: while all participants in DHCD program have in common the fact that they are financially vulnerable, their goals, motivations, barriers to participation and preferred channels for engagement with an energy efficiency program vary greatly based on a wide range of personal circumstances (e.g., rural/urban, employed/on fixed-income, …).

Finally, in its reporting on outreach activities undertaken in Q3-Q4 of 2022, DHCD highlights:

- Key initiatives to partner with utilities to promote DHCD run programs, mainly via bill messaging and inserts. Utilities' efforts to strategically promote DHCD offerings appears uneven across the State. The "Link with Utility Run Programs" section below discusses BGE "LMI Weekly Reports" as a concrete example of the EmPOWER utilities' capability to deploy targeted, data-driven outreach efforts for the benefit of greater enrollment in DHCD run programs.
- A ten-fold increase in the number of applications in the past three years. In 2022, DHCD received close to 1,000 applications in addition to the 9,600 referrals from OHEP[40].

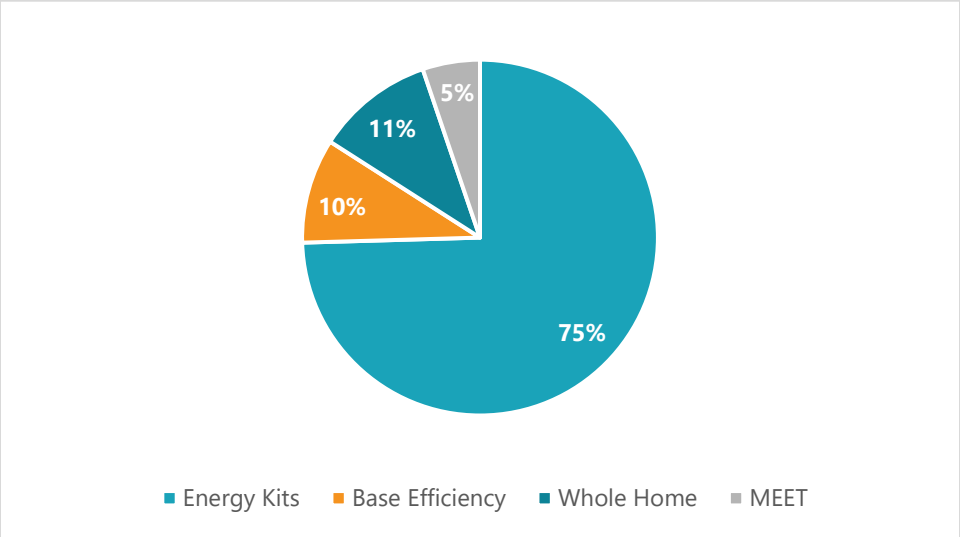


Figure 30: Breakdown of DHCD single family program participation, 2022

As DHCD continues to ramp up its energy kit program it will be crucial to understand the role played by energy kits in driving increased participation in the Base Efficiency or Whole Home programs. As shown in figure 30, in 2022, 75 percent of program participation comes from energy kits (with energy kits representing 61 percent of program participants when also

[40] DHCD 2022 Q3-Q4 Semi-Annual Report 2-15-2023, p. 34

accounting for the multi-family program). In future semi-annual reports, DHCD should report on how energy kits are driving participation toward the Whole Home or Base Efficiency program rather than leading to a significant decrease in energy savings by participant. To draw a full picture the following data would be needed: (a) break down of energy kits sent to single family applicants versus multifamily applicants , and (b) number of participants in the energy kit program that are also participating in other programs (e.g., Base Efficiency or Whole Home).

Figure 31 below shows the total percentage of eligible customers served from 2013-2020 and the percentage served in 2022 alone. This indicates a significant increase in the percentage of income-eligible households served, mainly because of the energy kit program. APPRISE's Energy Affordability Study noted "slight" disparities in the rate of eligible households served between utility service territory. Similar differences were observed in 2022.

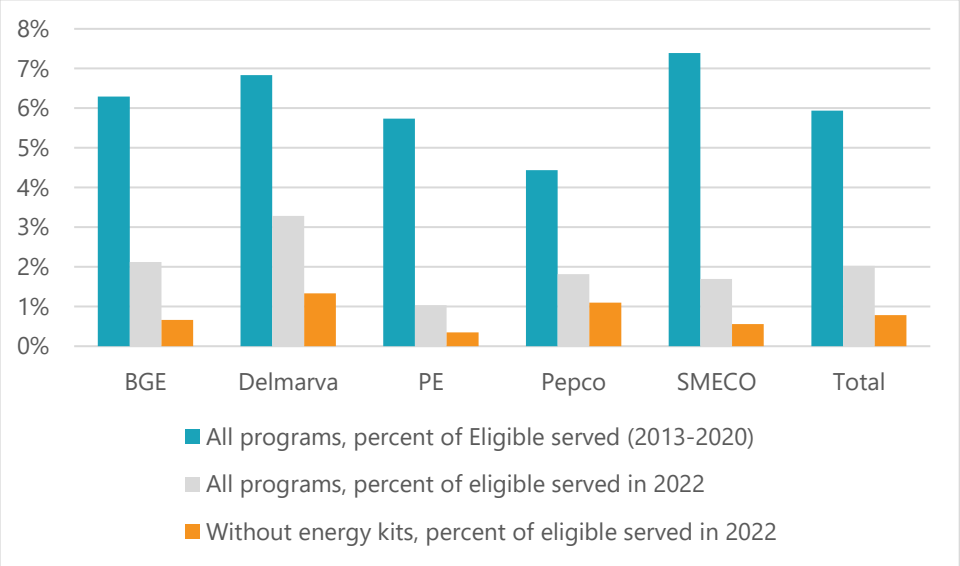


Figure 31: Proportion of eligible population served by DHCD programs.[41]

Multifamily

As shown in figure 32 below, 2022 participation in the MEEA program is on par with the participation level observed in 2021. DHCD notes that the program has "adequate demand to meet its forecast" and that "no marketing is currently scheduled to take place"[42]. However,

[41] Historical data on participation in DHCD run limited-income program from 2013 to 2020 was reproduced from APPRISE's Maryland Energy Affordability Study (ML 300518).
[42] DHCD 2022 Q3-Q4 Semi-Annual Report 2-15-2023, p. 34

DHCD should not wait for the next program cycle to ramp up its marketing and outreach efforts in order to meet significantly higher objectives[43].

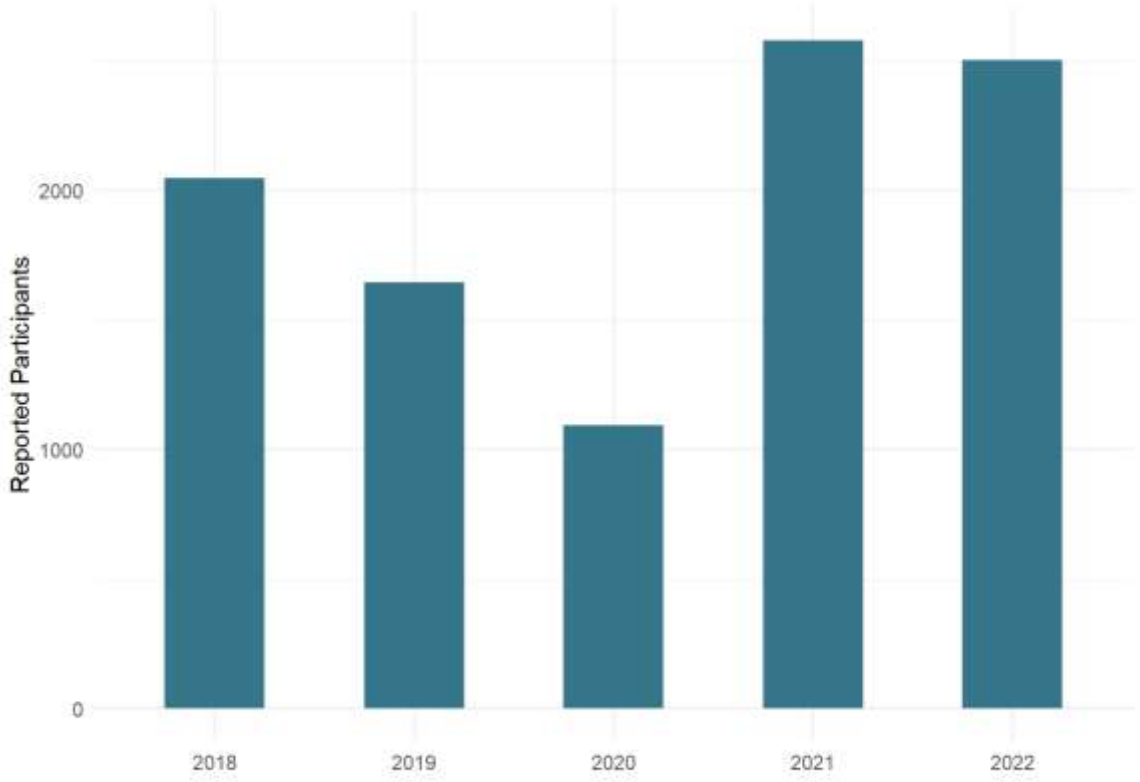


Figure 32: MEEHA Reported Participants, 2018 -2022

Link with the Utilities' Low-Income Initiatives

As shown in figure 33 below and discussed in the Residential Retrofit section above, there are more income-eligible ratepayers participating in the utility-run QHECs than in DHCD's Whole Home and Base Efficiency programs combined. Utilities also undertake targeted outreach to engage low-income customers with EmPOWER. As an example, PEPCO distributed 2,200 energy efficiency kits via participation in Capital Area Food Bank "Community Marketplace" events and 1,500 energy efficiency kits via local non-profit organizations.[44] BGE has also deployed weekly reports tailored to the specific needs of LMI ratepayers[45]. In its 2022 Q3-Q4 Semi-Annual Report BGE highlights how the LMI Video Home Energy Reports and LMI weekly Usage Report promote energy assistance programs run by OHEP. It is unclear to which extent they are also actively promoting DHCD-run programs. However, combined with the level of

[43] Per House Bill 169 / Senate Bill 144 "Public Utilities - Energy Efficiency and Conservation Programs - Energy Performance Targets and Low-Income Housing" DHCD must "develop a plan to provide energy efficiency retrofits to all low-income households by 2031". In addition, DHCD is now required to achieve "a target annual incremental gross energy savings".
[44] Pepco 2022 Q3-Q4 Semi-Annual Report 2-15-2023, p.20
[45] BGE 2022 Q3-Q4 Semi-Annual Report 2-15-2023, p.25

income-eligible households participating in QHEC, BGE pilots demonstrate the utilities' unique ability to reach Marylanders with low and limited incomes and drive participation in EmPOWER.

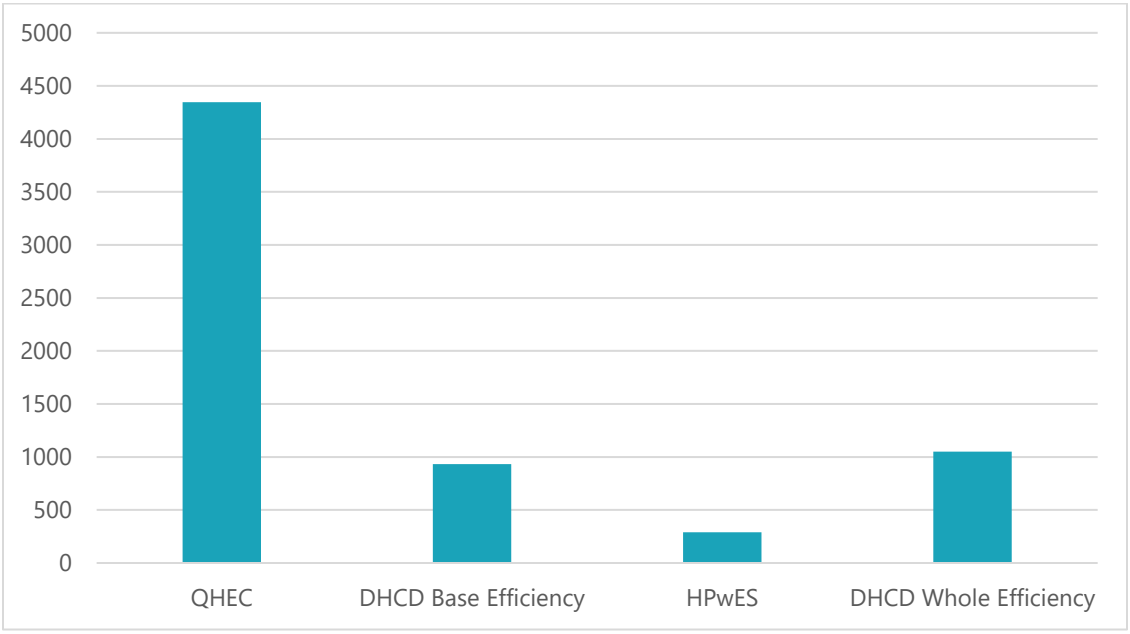


Figure 33: Number of known income-eligible participants in retrofit programs from utilities and DHCD in 2022

Finally, APPRISE notes that "utilities provide one of the best opportunities for reaching customers who face difficulty with their bills".[46] The Commission has determined that the utilities should not be assigned low-income energy saving goals, so as to avoid competition with DHCD run programs. However, we recommend that the utilities be assigned low-income *participation* goals and directed to prioritize enrollment in DHCD run programs over utility run retrofit offering such as QHEC and HPwES. We anticipate that DHCD programs will be less budget-constrained in the next cycle. In order to reach new statutory goals and improve the equity of EmPOWER overall, increasing participation will be DCHD's central challenge. As noted through these comments (e.g., Appliance Recycling, Behavior, and Residential Retrofit), the utilities have many program areas that can and should help drive eligible customers toward DHCD programs. When the utilities cannot claim savings credit for DHCD achievement, having specific goals around increasing program participation helps them justify substantive investments in their program strategies needed to support low income customers.

[46] Applied Public Policy Research Institute for Study and Evaluation ("APPRISE") Maryland Energy Affordability Study - Final Report ("Energy Affordability Study") ML 300518, p.17

Priority Limited-Income Recommendations for 2024-2026

In its March 20, 2023 order concerning target-setting for the 2024-2026 EmPOWER program cycle, the Commission noted the need for "analysis concerning the root cause(s) behind the high energy burdens faced by limited-income customers."[47] The Commission should order its Staff to issue a Request for Proposal (RFP) for market study for limited income populations (and other demographic groups with equity concerns). The study would seek to understand the source of energy unaffordability as recommended by APPRISE, as well as barriers associated with participation in EmPOWER low-income programming. It is worth noting that by listening to community-based organizations, and potentially to program beneficiaries, this study would strengthen EmPOWER stakeholder engagement efforts. Although it will not be feasible to complete the study before 2024-2026 plans are complete, it should still be undertaken in order to inform outreach and engagement activities in the new cycle.

Even if the utilities are not assigned low-income energy saving goals to avoid competition with DHCD run programs, the utilities should be assigned low-income participation goals and directed to prioritize enrollment in DHCD-run programs over utility-run retrofit offerings such as QHEC and HPwES.

We recommend that DHCD implement low-income electrification measures as part of the next program cycle. (In some cases, DHCD should start with pilots; in others electrification measures can be integrated into existing programs). DHCD is the likely means of delivering significant low-income electrification funding under IRA, which can be integrated with EmPOWER programs. Initial electrification efforts should focus on fuel switching for vulnerable households relying on unregulated fuels to maximize bill savings.

The utilities should be assigned limited income participation goals to support increased savings for DHCD programs without creating competition.

Demand Response

With the exception of Potomac Edison, the EmPOWER electric utilities offer customers and members a variety of options to encourage participation in Demand Response (DR), or "demand flexibility" programs. These programs use a variety of technologies, equipment, and behavioral/economic incentive strategies to encourage changes in residential load at critical or strategic peak moments on the grid to offset costs. They help demand follow supply rather than the other way around, which can be highly cost-effective. Some programs rely on specific equipment (e.g. smart thermostats) incented by the utilities, and others allow customers to "Bring Your Own Device" (BYOD), allowing more flexibility for customers with existing equipment.

Data Labeling Issues

The DR programs offered by the EmPOWER utilities are different from each other, with different branding and characteristics. This is not necessarily an inherent problem, but it adds complexity to review and communication.

[47] At page 25

Table10: Branded names of EmPOWER Demand Response programs by type

Program Type	BGE	Pepco	DPL	SMECO
Direct Load Control	Connected Rewards Peak Rewards (is closed to new enrollments)	Energywise	Energywise	CoolSentry
Behavioral DR	Smart Energy Rewards	Peak Savings Credit		My Energy Target

In addition to the results reported in the Summary tables, the utilities report mini-tables entitled "DR Details" which indicate status and changes in participants and enrolled devices, and "DR Call Logs", which record the results of DR events during the Semi-Annual period. Based on responses to OPC data requests, the BGE, SMECO and the PHI utilities each report savings differently in the Call Logs, making some comparisons difficult:

	Units	Type of Savings in Call Logs
BGE	MW	Actual
PEPCO	MWh	Potential
DPL	MWh	Potential
SMECO	MW	Potential

All utilities appear to be reporting *potential* MW savings in the summary tables. In the summary tables, BGE reports on its Behavioral DR program separately under "Dynamic Pricing" while Pepco and SMECO report savings for all DR programs together.

2022 Demand Response Performance

As with previous Semi-Annual reports, VEIC was unable to reconcile the savings (potential or actual) of DR events shown in the Call Logs with the data shown in the gross wholesale summary table. The summary tables show potential DR savings; there were no changes in data reported in the summary tables compared to the last Semi-Annual. As shown in Table 11, the utilities are still reporting that they were close to or exceeded forecasted DR potential based on data in the summary table. Across EmPOWER there is still just over 900 MW of available demand reduction potential in the residential sector, which is the equivalent to the capacity of a relatively large power plant.

Table 11: Forecasted and reported Demand Reduction potential

	"Reported" Peak Demand Reduction (Capacity) Compared to Forecasts
BGE (w/out Dynamic Pricing)	114%
BGE (including Dynamic Pricing)	114%
PEPCO	104%
DPL	84%
SMECO	89%

During the second half of 2022, BGE called only test Demand Response events. Pepco and Delmarva each reported one call event and SMECO did not call any DR events in 2022.

This illustrates the limitation of a DR program that is so heavily focused around big summer peak events. While critical for cost-effective grid management, these summer call events represent the tip of the iceberg for managing peak load. As the grid becomes more reliant on renewable resources such as wind and solar, it becomes more important to manage load on a *daily* basis (with those management challenges and opportunities varying across the seasons). Fortunately, the tools to do so are increasingly available. The GHG Potential Study focused on new types of DR potential and found significant opportunities to capture demand management savings in managing load on a daily basis, such as by shifting water heating demand.

As Maryland increases electrification of space heating, it also becomes more important to manage winter peak loads. The PJM Independent System Operator has issued alerts during winter periods, calling on utilities and consumers to conserve. According to data responses received by OPC, not all utilities have notified customers about these conservation alerts. Some utilities cited a lack of winter DR programs as part of the reason. This is a missed opportunity that will only grow more costly as our energy systems evolve.

All utilities should have more diverse DR offerings, for both summer and winter, in the next cycle. Table 12 shows enrollments in residential DR programs in proportion to the overall customer base, as well as net changes in enrollments during the period.[48] Pepco has the greatest share of customers enrolled in DR (57%) and SMECO the least (23%).

[48] Again, the utilities report on "participants" differently in the summary tables. BGE uses the number of customers enrolled, SMECO uses the number of active devices (a much larger number), and the PHI utilities left participants blank. Therefore, this report reflects "participants" using the number of enrolled customers as reported in the mini-table.

Table 12: Customer enrollments as a portion of total customers and change in enrollments, in the first half of 2022

	Residential Customer Count (EIA)	% of Customers Participating in DR	Net Change in Enrollments in 2022	
BGE (Peak Rewards)	1,155,397	26%	(4,543)	-0.4%
BGE (Connected Rewards)		3%	6,847	0.6%
PEPCO	520,204	57%	8,963	1.7%
DPL	177,697	36%	1,181	0.7%
SMECO	149,170	23%	1,402	0.9%

BGE has a portion of its customers enrolled in its legacy Peak Rewards program. Enrollment in its newer Connected Rewards program outpaced unenrollment in Peak Rewards for the first time during this semi-annual period. Enrollments at the other utilities increased only marginally during the period (Pepco's 1.7% increase was the greatest.)

Only BGE reported separately on BYOD vs non-BYOD savings, with the latter constituting most of the participants and savings.

Priority Demand Response Recommendations for 2024-2026

In the next cycle, all electric utilities should have demand response programs capable of reducing peak demand in winter and summer. They should increase subscriptions to event-based residential DR programs to at least 50% of ratepayers.

The utilities should strengthen and expand existing DR programs, both to prepare for electrification and to address increasingly severe weather. This includes greater efforts for truly flexible load and daily load management, such as a residential grid-interactive water heating program.

Each utility should ensure well-designed TOU and EV-charging rates are available for all customers. If whole house electrification rates are not already available, they should be piloted on an expedited basis.

Demand response programs focus on calling "events" on the hottest summer days are the tip of the iceberg for managing peak demand.

EmPOWER Working Groups

Limited Income Working Group

DHCD convened the Limited Income Work Group (LIWG) twice in the second half of 2022.

DHCD kicked off its program planning for the 2024-2026 EmPOWER cycle with a brainstorming workshop on September 28, 2022. The Office of People's Counsel strongly supports DHCD's efforts to engage a large set of stakeholders in shaping program design for the next EmPOWER Cycle. The Office of People's Counsel also commends DHCD for convening stakeholders at an early stage of program planning to ensure their contributions: this is key to ensure the output of this stakeholder engagement process can have a genuine impact on program design decisions. DHCD stakeholder engagement in EmPOWER design has continued in 2023 and is intended to tap into the experience of on the ground organizations to address key program design issues such as client engagement. DHCD's stakeholder engagement approach for 3-year planning could have informed the broader EmPOWER stakeholder engagement plan, however at this time the Commission has directed the utilities to adopt a more limited approach centered around a single large stakeholder meeting.

DHCD and Commission Staff also convened the LIWG on December 5, 2022, for a presentation of APPRISE's draft Energy Affordability Study report. DCHD filed the final report on behalf of the LIWG on December 15, 2022.

Midstream Working Group

The Midstream Work Group met monthly for a significant portion of 2022. During this time, the Commission's independent evaluator conducted important research, under direction from the Work Group. This included a comparison of midstream and downstream HVAC and HPWH programs in peer states.

Throughout 2022, VEIC and OPC continued to make and refine recommendations for program design changes and strategies for wholesale improvements to engagement with distributors and contractors. During Work Group meetings, utilities and their implementers described various challenges they faced. As a general matter, the utilities were unwilling to make fundamental changes to program design or implementation and instead pursued incremental growth in supply chain engagement. Although there were limited signs of progress, overall, we observed very inconsistent responses across the five utilities and their three separate third party implementers. In the fall of 2022, we recommended a set of program design and implementation changes directly to the Commission, which were not adopted.

The Q3-Q4 Semi-Annual reports again show poor results in HVAC program and HPWH measure.

By this time next year, Maryland will likely be the recipient of more than $100 million in additional federal funding for heat pumps. Without a better foundation of midstream engagement, the state will be less able take advantage of this transformational opportunity for building electrification needed to meet the state's climate objectives.

As described in the program sections above, it is our conclusion that the midstream program areas are unlikely to experience dramatically different results without a single statewide implementer that can execute a more advanced program design and streamline engagement with distributors and contractors. This should include both HVAC heat pumps and heat pump water heaters.

It is unclear if additional Midstream Work Group meetings will prove beneficial at this stage, while utilities focus on their 3-year plans for the next cycle. We recommend the Commission strongly encourage the utilities to develop a plan for a unified statewide implementer, with program design elements that make the process of promoting, stocking, and installing heat pump equipment—and fulfilling the administrative and financial requirements of the program—as simple as possible for distributors and contractors.

Evaluation Advisory Group (EAG)

The Evaluation Advisory Group continues to meet in a productive fashion to address evaluation, measurement and verification questions, ideally through consensus. We appreciate the efforts by the EAG facilitator (Joe Loper) to produce agendas a day ahead of the meeting so parties can be more prepared to address them.

Some of the questions that come up at the EAG have measurement and evaluation components but also overlap with other Work Groups. This includes reporting (the EAG deals directly with how savings are measured but it does not typically address how utilities report savings in the Semi-Annuals), or midstream (improving the midstream programs has been connected to gathering evaluation data), or future programming (whether new GHG goals are annual or lifecycle determines the measurement protocols EAG will need to develop.) Commission staff can and should play an active role in facilitating across Work Groups to ensure efficiency and transparency.

EmPOWER Reporting & Process Improvement (ERPI) Work Group

Planning for the new cycle of EmPOWER should include a complete review of Semi-Annual reporting. In nearly every Semi-Annual review—including this one—VEIC comments on unclear or inconsistent reporting. For example, each utility still uses different definitions for participants in HPwES, and for reported MW savings in the DR line of summary tables. (We also appreciate that there have been some important improvements to reporting and transparency over the last few years. The new cycle is the most efficient time to identify reporting deficits and establish clarity and consistency across utilities.

In addition, new reporting definitions and changes to tables will be needed to include GHG savings.

We strongly recommend that this process commence now and not be postponed until there is time pressure to generate new reports. We recommend the ERPI Work Group hold monthly meetings starting no later than June, with a goal of presenting consensus reporting changes or templates by October 15, 2023.