An Examination of District Residents' Experiences with Utility Burdens and Affordability Programs

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Key Terms

Area median income (AMI). In each region, the income level at which half of households earn more per year and half earn less per year. The U.S. Department of Housing and Urban Development calculates AMI each year for every metropolitan region in the country based on number of people in the household.

Energy burden. The percentage of annual household income spent on annual energy bills, including electricity, natural gas, and other heating fuels.

Energy insecurity. The inability to adequately meet basic household heating, cooling, and energy needs over time.

Federal level poverty (FLP). The measure of income used to determine eligibility for certain programs and benefits. Poverty guidelines for households based on number of persons in the household are set by the Department of Health and Human Services.

State median income (SMI). In each state, the income level at which half of households earn more per year and half earn less per year, based on number of persons in the household.

Utility burden (combined burden). The percentage of annual household income spent on annual bills for electricity, natural gas, other heating fuels, and water.

Water burden. The percentage of annual household income spent on water bills.

Executive Summary

KEY FINDINGS

- Despite continued economic growth, racial inequities persist in the District of Columbia. Historical and structural factors have produced stark disparities in homeownership, employment, wealth, education, and health outcomes. The COVID-19 pandemic and related economic fallout has had widespread impacts in the District, disproportionately affecting Black, Latinx, and low-income residents.
- DC metro area residents with disproportionately high energy and water burdens include low-income households, non-high school graduates, households with a family member with a disability, older adults over 65, Black households, Hispanic households, renters, and households in pre-1980 buildings.
- The median low-income household (≤60% SMI) in the DC metro area experiences energy and water burdens about five times higher than the median non-low-income household.
- Interview findings reveal that energy assistance programs provide financial support and stress relief to households facing acute or chronic hardships. While staff and program participants agreed on many core issues, clearer communication is needed on program details and their environmental impacts.
- This report's recommendations, based on qualitative and quantitative analyses, note how DOEE can improve the awareness and accessibility, targeting, design, and delivery of its five energy and water affordability programs.

This report analyzes District residents' experiences with utility burdens and energy and water affordability programs offered by the Department of Energy and Environment (DOEE). The report includes a literature review that explores the root causes and systemic drivers of racial inequity in the District, quantitative analysis that calculates utility burden data for households in the DC metro area, primary data collection based on qualitative research on the experiences of DOEE utility assistance recipients, and recommendations aimed at improving access to and utilization of these programs by District residents.

The report focuses on DOEE's five affordability programs, including

- Low-Income Home Energy Assistance Program (LIHEAP)
- Utility Discount Program (UDP)
- Solar for All (SFA)
- Weatherization Assistance Program (WAP)
- Clean Rivers Impervious Area Charge (CRIAC) Residential Relief Program

Historical policies and practices that led to discrimination in zoning laws, mortgage lending, employment, and access to quality education have led to long-standing patterns of racial segregation and racial disparities in income and wealth, particularly affecting Black residents in the District (Kijakazi et al. 2016). These structural barriers had and continue to have implications for the racial wealth gap in the city and for residents' ability to afford safe and healthy housing, food, and utilities, among other basic necessities. The COVID-19 pandemic and subsequent recession have disproportionately affected Black, Latinx, and low-income residents, exacerbating these inequities.

UTILITY BURDEN FINDINGS

Energy, water, and combined utility burden analyses paint a picture of energy and water burdens in the District. Across these analyses, similar groups experienced disproportionately high burdens, including low-income households (i.e., ≤60% SMI), households who receive food stamps, non-high school graduates, households with a family member with a disability, older adults over 65, Black households, Hispanic households, renters, and households in pre-1980 buildings. These findings are representative of all households in the DC metro area, the majority of which do not receive utility assistance. These findings do not differentiate between households who receive and do not receive utility assistance.

Energy Burden Findings

- The energy burden of low-income households is 4.5 times higher than that of non-low-income households.
- The median energy burden for Black and Hispanic households is 45% higher than that of white (non-Hispanic) households.
- Across the DC metro area, 64% of low-income households face a high energy burden (above 6%), and 40% of low-income households face a severe energy burden (above 10%).
- One-fourth (25%) of low-income households experience an energy burden of at least 15%, which is 7.5 times the median for the DC metro area.

Water Burden Findings

- The median water burden of low-income households is 5.4 times higher than that of non-low-income households.
- The median water burden of Hispanic households is 63% higher and of Black households is 51% higher than it is for white (non-Hispanic) households.
- Low-income households have a median water burden that is 4.5 times higher than the metro area median; similarly, low- to moderate-income households (≤100% AMI) have a median water burden that is about 2 times higher.
- One-fourth (25%) of low-income households experienced a water burden of at least 7.4%, which is more than 12 times the median water burden in the DC metro area.

Combined Utility Burden Findings

- The median combined energy and water burden of low-income households is almost 5 times higher than that of non-low-income households.
- The median combined burden of Hispanic households is 55% higher and of Black households is 42% higher than that of white (non-Hispanic) households.
- The median combined energy and water burdens accounts for up to 11.2% of income for low-income households, which is 4.3 times higher than the combined burden for the median DC metro area household.

INTERVIEW FINDINGS

The interviews with 30 participants of DOEE's energy and water affordability programs provided insights into participants' household characteristics and experiences of energy insecurity along with their experiences with DOEE programs. Through the interviews with 10 DOEE program staff and administrators, we identified staff perspectives on program challenges, client and participant base, and impact of the COVID-19 pandemic on program operations and outcomes. Below are key themes across interviews as well as points of convergence and divergence across participants and program staff.

Participant Perspective

- Participants prioritized utility bills as a key household expense but faced energy insecurity due to recent economic shocks or to chronic low or fixed household incomes.
- In addition to seeking energy assistance benefits, households reduced energy use and attempted minor weatherization interventions to save on energy bills and maintain thermal comfort.
- Participants expressed gratitude for DOEE support and noted the impacts of energy assistance on bill management and stress reduction.
- Preferences for benefits delivery was mixed, with some households preferring monthly distributions and others preferring lump sum payments.
- Opportunities for enhanced communication and clarity on program details were noted.

Program Staff and Administrator Perspectives

- DOEE staff expressed empathy and a commitment to delivering comprehensive services, including adapting service delivery and program elements to better assist participants.
- The COVID-19 pandemic accelerated the transition to online applications and electronic communications with clients; however, a core aspect of their approach, which involves strong customer relations, was significantly compromised. Staff expressed concern that the elderly and technologically challenged may not be adequately served, despite identifying continued need for additional supports.

Points of Convergence/Divergence

- Participants and staff agreed that DOEE program offerings and customer service were robust and superior to available alternatives.
- Staff and administrators highlighted the connection between their energy assistance programs and ensuring a just clean energy transition for District residents, yet participants were unclear about how they could contribute to greater environmental stewardship through DOEE programs.

- Gaps in service to rental and multiple unit housing residents were noted by both participants and staff, while prioritizing energy and conservation/weatherization was emphasized by participants.

POLICY RECOMMENDATIONS

We developed the following policy recommendations that identify barriers and opportunities to increase the effectiveness of DOEE affordability programs. These recommendations also aim to reduce high energy and water burdens in order to improve utility affordability, home health and comfort, and overall economic prosperity of District residents.

Program Awareness and Accessibility Recommendations

- Increase targeted direct program outreach and re-enrollment efforts
- Align water and energy affordability support and outreach
- Employ diverse methods of outreach and continued communication
- Provide follow-up confirmation on benefits and services
- Connect energy saving and clean energy messaging with environmental benefits

Program Targeting Recommendations

- Target resources towards households with disproportionately high utility burdens
- Target resources towards households experiencing disproportionate health burdens
- Provide resources for affordable housing building owners to help keep rents affordable
- Develop and include additional equity-related goals to measure program success
- Consider tiered benefits to support moderate-income household needs

Program Design and Delivery Recommendations

- Continue building robust stakeholder and community engagement practices
- Increase structural solutions for utility affordability, such as weatherization and solar energy
- Create a one-stop-shop model for program enrollment
- Maintain emergency water assistance and create a leak reduction program
- Validate and educate on energy conservation strategies

These recommendations are based on the qualitative analysis, and also reflect findings from the literature review and quantitative utility burden analysis. The report includes anonymized quotations from interviewees in relation to and in support of the recommendations.

CONCLUSION

This report finds that even before the pandemic, many District residents experienced systemic inequality and high utility burdens that led them to seek assistance. Low-income District households are especially overburdened by utility bills as compared to low-income households nationally. DOEE's utility affordability programs reduce the District's negative

environmental impact while improving affordability and comfort for low- and moderate-income District residents. As the pandemic continues to affect the lowest income residents, the recommendations from this report can help to increase equitable access to and utilization of solar installations and energy efficiency and weatherization investments as a means of supporting economic, environmental, and equity-related District goals.

Introduction

The Department of Energy and Environment (DOEE) currently provides a set of programs and services to assist low- and moderate-income residents facing high utility burdens. A high utility burden—the percent of income spent by households on electricity, gas, fuel oil, and/or water—can greatly impact a household's ability to afford other basic necessities. When residents have to choose between paying utility bills and other necessities, they may endure significant health and financial impacts. To ease the utility burden on these households, DOEE administers utility affordability programs that provide relief through different mechanisms, including improved access to solar generation and weatherization, subsidized rate structures, and one-time bill assistance payments.

DOEE administers five such utility assistance programs. Table 1 lists these programs, income eligibility, and description of the services provided. This study analyzes these five programs from the perspective of DOEE staff and program participants to provide programmatic recommendations.

Table 1. Energy and water assistance programs studied in this report

DOEE program	Income eligibility	Provided services
Low Income Home Energy Assistance Program (LIHEAP)	60% state median income (SMI)	One-time annual energy bill assistance between $250 and $1,800, determined based on household size, total household income, heating source, and dwelling type
Utility Discount Program (UDP)	60% SMI	Utility bill discount of up to $475 per year on electric bills, up to $276 for gas heating bills, and/or over $500 annually on water and sewer bills
Weatherization Assistance Program (WAP)	60% SMI	Weatherizes homes with measures such as insulation, duct sealing, heating and cooling systems repair or replacement, air infiltration mitigation, and ENERGY STAR lighting and appliances; improves home energy efficiency, lowers bills, and improves home comfort
Solar For All (SFA)	80% area median income (AMI)	Free installation of solar photovoltaic systems on homes or participation in community solar so that participants save about $500 per year on electric bills
Clean River Impervious Area Change (CRIAC) Residential Relief Program	100% AMI	Monthly water bill discount for single-family and individual homes; DC Water ratepayers fund the program; three tiers of assistance ($75, $50, and $15 per month), determined by household size and income; one-time emergency benefit of up to $2,000 launched during the pandemic to provide emergency relief for water bill arrearages

PROJECT OVERVIEW AND METHODOLOGY

This study uses qualitative and quantitative research methods to analyze utility burdens among District residents and the experiences of utility affordability program participants, in order to provide recommendations to improve the effectiveness, reach, and outcomes of DOE's utility assistance programs. To do this, we analyze household level data to estimate utility burdens for District residents as well as conduct interviews with DOEE program staff

and program participants. The recommendations provide guidance to create more equitable program outcomes and benefits for District residents.

The intended audience for this report is DOEE staff who design, manage, and evaluate energy utility assistance programs. The products of this research include a literature review that explores the root causes and systemic drivers of racial inequity in the District, quantitative analysis calculating utility burden data for households in the DC metropolitan statistical area (MSA), primary data collection through qualitative research on the experiences of DOEE utility assistance recipients, and recommendations aimed at improving access and utilization of these programs by District residents.

Our research questions are

- How do socio-political factors in the District impact energy and water insecurity?
- Which households are the most utility-burdened in the DC metro area?
- What factors lead residents to seek energy and water assistance programs?
- How well do DOEE's energy and water assistance programs serve the needs of individual participants and the District population as a whole?
- How can DOEE remove barriers and increase the effectiveness of its energy and water affordability programs in order to reduce high utility burdens and improve health and economic outcomes for District residents?

This report includes our results organized by our four major research activities:

Background and literature review. We explore the causes and impacts of high utility burdens through the socio-political context of the District of Columbia. We analyzed academic articles, policy reports, agency reports, and relevant local news media and blogs that provide insight on racial and economic equity in the District and growing affordability challenges.

Energy and water utility burden analysis. We conducted an energy and water utility burden analysis, using U.S. Census Bureau data for the DC metro area, that identifies which demographic groups and types of households experience disproportionately high utility burdens. We use the 2019 American Housing Survey (AHS) data to calculate energy, water, and combined energy and water burdens for households across the DC metro area.

Analysis of interviews with DOEE program staff and program participants. We conducted 10 interviews with DOEE program staff who manage or support at least one of DOEE's five utility affordability programs to gain insights into how programs are currently operating. We also conducted 30 interviews with District residents who participated in one or more of those programs to learn about impacts on their financial stability, their perceptions and use of energy and water, and their experience with DOEE's energy assistance programs.[1] We transcribed the interviews and developed a codebook that identified emerging themes that characterize the nature of energy insecurity in the District. Performing an axial coding, we

[1] See Appendix F for anonymous demographic information about program beneficiary interview participants.

then identified and assessed data patterns and potential causal relationships, contextual factors, impacting conditions, and barriers and facilitators to navigating local resources, receiving, and benefiting from assistance.[2]

Policy recommendations and conclusion. Based on our research, we developed recommendations that are intended to address barriers and increase the effectiveness of DOEE utility assistance programs so that they reduce high utility burdens and lead to positive outcomes for District residents. These recommendations explore program awareness and accessibility, targeting, design, and delivery.

In addition to the main report, the project team submitted supplemental documentation to DOEE, including transcripts of resident interviews, the interview codebooks, and complete energy and water burden calculations.

Background

In this section, we explore the causes and impacts of high utility burdens on District residents, with a focus on the District's social, political, and economic context that has given way to persistent economic and racial inequality. We review academic articles, policy reports, agency reports, and relevant local news media and blogs from the past five years to gather information on the sociopolitical context of the District. We also explore literature on energy and water affordability broadly and in the District, as well as the landscape of programs available for District residents to address energy and water affordability needs.

SOCIOECONOMIC CONTEXT OF THE DISTRICT OF COLUMBIA

Historical policies and practices that led to discrimination in zoning laws, mortgage lending, employment, and access to quality education have resulted in long-standing patterns of racial segregation and racially based income and wealth disparities in the District, particularly affecting Black residents (Kijakazi et al. 2016).[3] These structural barriers had and continue to have implications for residents' ability to afford safe and healthy housing, food, and utilities, among other basic necessities. Since the 2000s, the city has experienced growth, reflected in neighborhoods becoming wealthier, whiter, and younger (Rabinowitz 2017). Over the past decades, the District's growing economic prosperity has been uneven for residents and neighborhoods: it has not benefited longtime Black residents as it has their white counterparts and other newcomers.

Racial wealth and income gaps in the District remain stark. In 2016, the median household income for the District's Black residents was less than one-third that of white residents, and Latinx median wealth was half that of white residents (Gebriel 2018). Incomes are lowest in Wards 7 and 8, which have the highest concentration of Black residents. The District's white residents have a net worth 81 times greater than Black residents. White residents have

[2] Axial coding is a technique used to identify core themes during qualitative data analysis through the process of relating codes (categories and concepts) to each other.

[3] For more of a historical overview of the context and structural barriers predicating the racial wealth gap in the District see, *The Color of Wealth in the Nation's Capital,* available at www.urban.org/research/publication/color-wealth-nations-capital/view/full_report.

wages that are twice that of Black residents, and lower unemployment rates compared to Black residents (Kijakazi et al. 2016; Lassieter 2017). These factors also contribute to Black residents' higher rates of homelessness. Overall, 88% of people experiencing homelessness in the District are Black, although Black residents make up 48% of the population (Washington Legal Clinic for the Homeless 2019). As the economic recession and impacts of the global pandemic continue to plague the city, Black and Latinx renters, both nationally and in the District, face the greatest threat of eviction and homelessness (Wedeen 2021). Researchers have also found that evictions are tied to an increase in coronavirus cases and deaths, making this risk even more dire during this public health emergency (Leifheit et al. 2020).

Housing Affordability in the District

Persistent wealth inequity in the District has been worsened by wage increases not keeping pace with other rising costs, such as housing. In 2020, even as the minimum wage increased to $15 an hour—an additional $3.50 or 30% increase from the 2016 minimum wage—this increase did not keep pace with rising housing costs. Transportation and food costs have also increased in the District over time. According to the U.S. Bureau of Labor Statistics' consumer price index, over the last 20 years, expenses for transportation, food, and housing in the DC metro area have increased by 43%, 59%, and 70%, respectively (BLS 2021a).

Over the last two decades, the number of affordable housing units in the District has decreased while the number of high-cost housing units has multiplied (District of Columbia DHCD 2019). In 2002, 40% (58,000 rental units) of the District's housing stock rented for less than $800 per month, but by 2013 this fell to 20% (33,000 rental units) (Rivers 2015). The Fair Market Rent (FMR) for a two-bedroom apartment in the District is roughly $1,700 per month. In order to afford this level of rent and utilities, that is, without spending more than 30% of income on housing, a household must earn nearly $5,700 monthly (or $68,000 annually). Based on a 40-hour work week, this represents an hourly wage of about $33—more than double the District's current minimum wage—that is needed to afford housing (NLIHC 2020). To put this number in a national context, the District has the fourth highest "housing wage" in the country (following Hawaii, California, and Massachusetts) (NLIHC 2020).

Over the last decade, many longtime District residents have experienced waves of gentrification and displacements as the rise in housing costs outpaces incomes (ONE DC 2017; Rivers 2015). Between 2000 and 2013, nearly 40% of the District's lower-income neighborhoods experienced gentrification and 20,000 Black residents were displaced due to increased costs of living in their neighborhoods, making DC the city with the highest intensity of gentrification in the U.S. (Richardson, Mitchell, and Franco 2019; Richardson, Mitchell, and Franco 2020). For example, over the past decade, Navy Yard has experienced rapid and drastic changes, with a 29% increase in white residents, an 18% increase in the proportion of households earning at least $100,000, and a 15% increase in the proportion of young residents (Rabinowitz 2017). Additionally, between 2000 and 2010, the Columbia Heights neighborhood experienced significant demographic change: the Black and Hispanic population decreased by about 30% and 10%, respectively, and the white population grew by nearly 140% (Tatian and Lei 2021).

The increase in the cost of living, especially for Black communities and communities of color, has led residents to forego necessities and resources needed for a healthy lifestyle and has forced many into substandard housing that contributes to poor health outcomes (Woolf et al. 2018). The relationship between health, wealth, and housing helps explain the disparate health outcomes reflected in the District. The current public health crisis has also continued to exacerbate these persistent health inequities.

Rising Utility Costs in the District

As housing costs have risen, utility costs in the District have also increased over time. From 2000 to 2019, the average electricity bill for District residents increased 78%, from $55 to $98 per month. Figure 1 shows the change in electric bills in the District from 2000 to 2019. Similar numbers for natural gas are not available.

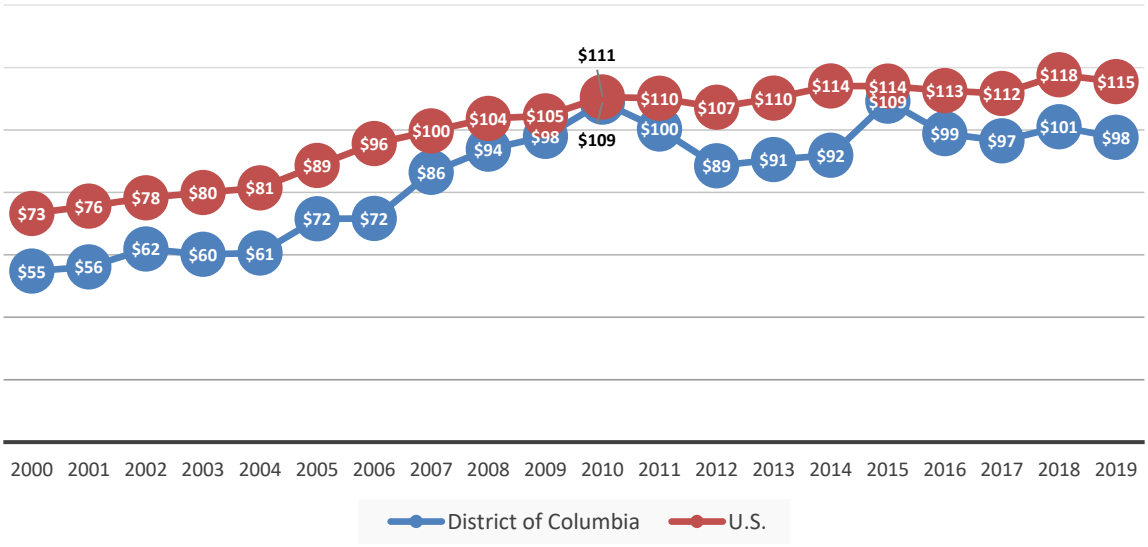


Figure 1. The average monthly electricity bill in the District of Columbia and U.S. from 2000 to 2019. ***Data from www.eia.gov/electricity/sales_revenue_price/.***

DC Water bills have also been on the rise in recent years. In 2018, DC Water implemented a new rate structure that increased the average residential bill by 5.9%, from $102.30 in 2018 to $108.32 in 2019 (DC Water 2018). Recently, DC Water's board approved increasing their residential and multifamily water rates for the fiscal years 2021 and 2022. With these new rates, DC Water projects the average monthly residential water and sewer bill would be $110.21 in 2021, up from $103.81 in 2020. This will increase water costs by an average of 6%, or $89 per household annually in 2021 (DC Water 2020).

Increases in utility bill rates can exacerbate financial pressures for residents experiencing hardship and may lead many to seek assistance and support. Between April 2019 and June 2020, the Office of the People's Counsel (OPC), the consumer advocate for District residents, responded to over 450 complaints about high DC Water bills, disconnections, and payment disputes (District of Columbia OPC 2020). OPC received the most complaints about water affordability from Ward 7 residents, followed by Ward 4 and then Ward 5 residents (District

of Columbia OPC 2020). While the types of complaints varied across wards, they included billing disputes, payment problems, leaks in public and private areas, meter issues, CRIAC program issues, payment arrangements, high bills, and disconnections (District of Columbia OPC 2020). OPC also received 912 complaints for the Potomac Electric Power Company (PEPCO), 444 complaints for Washington Gas, and 164 complaints for third-party energy providers during FY2019 (District of Columbia OPC 2021). This indicates the need for utility affordability support, and DOEE can continue to ensure that residents have access and information about available water affordability resources.

The Impact of COVID-19 on District Residents

As of January 2021, the COVID-19 pandemic and related economic fallout has had widespread impact in the District, most notably affecting Black, Latinx, and low-income residents. These disproportionate impacts reflect long-standing inequalities, often stemming from historical policies that allowed for racial, wealth, and occupational discrimination, segregation, and exclusion from institutional systems. This historical and present socioeconomic context has made Black and Latinx communities and communities of color most vulnerable to exacerbated food insecurity, energy insecurity, housing instability, and access to proper health services during the pandemic (Gathright 2020; Crawford and Huddleston 2020; CBPP 2021).

Low-income Black communities have been hit the hardest by the impacts of COVID-19, especially Wards 7 and 8 (Gathright 2020; Kathpalia and Zickhur 2020). Before the pandemic, neighborhoods located in the Northwest (i.e., Wards 1–6) had a higher health index (high opportunity for good health) than neighborhoods in the Southeast (i.e., Wards 7–8) where more than 90% of the residents are Black. This difference is influenced by social determinants of health such as race, education, housing, income, and social environment (Woolf et al. 2018). The same patterns are playing out among children, where Black and Hispanic children and children from low-income households are showing higher COVID positivity rates than their white and more affluent counterparts (Goyal et al. 2020).

Across the District, many residents are experiencing an economic crisis, with unemployment remaining as high as 7.9% and many households behind on mortgage and rent payments (BLS 2021b). Between July 9 and 21, 2020, 11% of District renters reported not paying their rent on time or deferring payment (CBPP 2021). In August 2020, rent-burdened households in the District represented 48% of the total population and 25% of renters of color in the District had missed or deferred rents (McCargo, Choi, and Walsh 2020).[4] During the same time period, 12% of adults (63,000) and 25% of children (45,000) in the District reported that they did not have enough to eat (CBPP 2021).

While the pandemic has compounded affordability challenges for many vulnerable households, the unemployment rate has varied drastically across Wards. Between April and May 2020, Ward 8 residents experienced a 20.7% unemployment rate, while Ward 1

[4] The Urban Institute defines rent-burden households as households that spend more than 30% of their income on rent.

residents experienced an 8% unemployment rate, and Wards 2 and 3 had the smallest increase in unemployment (Taylor 2020).

The Office of People's Council has found that the financial fallout of the pandemic has limited many households' ability to keep up with their utility bills. The moratoriums have helped to keep people connected to services, yet climbing and unpaid bills remain a significant concern moving into 2021. OPC found that high bills topped its list of 1,782 complaints received in FY2019 (District of Columbia OPC 2021). Economic and social factors such as job losses, less disposable income to pay bills, and more energy and water used at home due to stay-at-home orders are leading to rising utility debt.

Total utility bill arrearages across all households are much higher than in the past, indicating that many more households are in arrears. Table 2 includes total bill arrearages for PEPCO, Washington Gas, and DC Water households, across all households and those enrolled in low-income discount rate programs. As of September 2020, the average residential customer was behind by $400 for electricity, $440 for natural gas, and $463 for water bills. Due to the shut-off moratorium, households with arrearages are not being disconnected from electricity, natural gas, or water services. However, household arrearages continue to grow each month that bills remain unpaid. Utility assistance will be even more urgent when the public health emergency ends, and households need to address unpaid bills to keep their utility services connected.

Table 2. Total bill arrearages for PEPCO, Washington Gas, and DC Water customers in the District (as of September 2020)

	Total residential arrearages	Total low-income arrearages	Total residential customers in arrears	Total low-income customers in arrears	Average residential customer arrearage	Average low-income customer arrearages
PEPCO	$25,776,277	$4,407,363	64,434	12,920	$400	$341
Washington Gas	$10,596,974	$1,914,961	24,099	3,579	$440	$535
DC Water	$10,142,444	N/A	21,899	N/A	$463	N/A

Data for PEPCO and Washington Gas from PUC Filings, edocket.dcpsc.org/public/search/casetype/ardir. PEPCO data from "Pepco's monthly Arrearages and Disconnections Report," December 21, 2020. Washington Gas data from "WGL's Arrearages and Disconnections Report," December 21, 2020. Data for DC Water from October 2020 report, "DC Retail Rates Committee Package," www.dcwater.com/sites/default/files/event_attachment/DC%20Retail%20Rates%20Committee%20Package%2010.20.20.pdf.

CAUSES AND IMPACTS OF HIGH UTILITY BURDENS

Researchers have explored how energy burdens differ across demographic groups, building types, and locations. Many studies have found that certain demographic groups experience disproportionately high energy burdens, including Black, Hispanic, Native American, and older-adult households (Lewis, Hernández, and Geronimus 2019; Drehobl, Ross, and Ayala 2020). Researchers generally define a "high energy burden" as spending more than 6% of income on energy bills.[5] Some policymakers have begun to design policies and plans to

[5] Researchers estimate that housing costs should equate to no more than 30% of household income, and household energy costs should be no more than 20% of total housing costs, so that affordable energy costs

achieve an affordable energy burden level below the 6% threshold.[6] Similarly, the District's 2020 LIHEAP Energy Burden Analysis study recommends a 3% energy burden goal for LIHEAP participants (APPRISE 2020). This definition excludes transportation costs, which have been found to disproportionately impact low-income communities and communities of color as well. This number also does not include the added costs associated with late fees and shutoffs that those who face high utility burdens are likely to encounter.

While low incomes are a substantial factor driving higher energy burdens, energy inefficient housing also plays a large role. According to the 2017 American Housing Survey, 9% of total U.S. households completed an energy efficient improvement in the past two years, but only 17% were low-income households (Drehobl, Ross, and Ayala 2020). Additional research examining energy benchmarking data in a few major cities has found that households from both the lowest- and highest-income brackets had the highest energy use intensity (EUI); that is, they had the highest energy consumption per square foot. While consumption behaviors are regarded as the driver for high EUI among higher-income households (i.e., likely to use large amounts of energy to power larger homes and more electronics and devices), the researchers point to inefficient heating and lighting to help explain the high EUI among low-income households (Kontokosta, Reina, and Bonczak 2019). This suggests that inefficient infrastructures rather than inefficient behaviors lead to higher energy use and expenditures for low-income households.

Table 3 includes the main drivers of high energy burdens, including physical, socioeconomic, behavioral, and policy-related factors. High energy burdens are correlated with negative health, economic, and social impacts. The high cost of household energy can have mental health impacts, such as chronic stress, anxiety, and depression, associated with fear and uncertainty around access to energy and the inability to control energy costs, as well as compounding fears of late fees and shutoffs (Hernández 2016).

should be no greater than 6% of total income. For decades, researchers have used the thresholds of 6% as a high burden and 10% as a severe burden (APPRISE 2005). ACEEE uses these thresholds in our most recent energy burden report (Drehobl, Ross, and Ayala 2020). To clarify, high and severe energy burdens are not mutually exclusive. All severe energy burdens (> 10%) also fall into the high burden category (> 6%).

[6] See 2020 ACEEE report, *How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burdens across the U.S.,* for examples of city and state-led policies to address high energy burdens: www.aceee.org/research-report/u2006.

Table 3. Key drivers of high household energy burdens

Drivers	Examples of factors that affect energy burden
Physical	Housing age (i.e., older homes are often less energy efficient)
	Housing type (e.g., manufactured homes, single-family, and multifamily)
	Heating and cooling system (e.g., system type, fuel type, and fuel cost)
	Building envelope (e.g., poor insulation, leaky roofs, inefficient and/or poorly maintained HVAC systems, and/or inadequate air sealing)
	Appliances and lighting efficiency (e.g., large-scale appliances such as refrigerators, washing machines, and dishwashers)
	Topography and location (e.g., climate, urban heat islands)
	Climate change and weather extremes that increase the need for heating and cooling
Socioeconomic	Chronic economic hardship due to persistent low income
	Sudden economic hardship (e.g., severe illness, unemployment, or disaster event)
	Inability to afford (or difficulty affording) up-front costs of energy efficiency investments
	Difficulty qualifying for credit or financing options to make efficiency investments due to financial and other systemic barriers
	Systemic inequalities relating to race and/or ethnicity, income, disability, and other factors
Behavioral	Information barriers relating to available bill assistance and energy efficiency programs and relating to knowledge of energy conservation measures
	Lack of trust and/or uncertainty about investments and/or savings
	Lack of cultural competence in outreach and education programs
	Increased energy use due to occupant age, number of people in the household, health-related needs, or disability
Policy-related	Insufficient or inaccessible policies and programs for bill assistance, energy efficiency, and weatherization for low-income households
	Utility rate design practices, such as high customer fixed charges, that limit customers' ability to respond to high bills through energy efficiency or conservation

Source: Drehobl, Ross, and Ayala 2020.

High energy burdens reduce a household's disposable income and increase its likelihood of staying trapped in the cycles of poverty (Bohr and McCreery 2019). In particular, Black households are more likely to experience this pernicious cycle, which includes persistent income inequality along with limited safety nets (i.e., savings, bill assistance, and social capital) and thus limited ability to invest in homes or education, and high energy burdens (Lewis, Hernández, and Geronimus 2019). Households that experience high monthly utility bills are likely to engage in coping strategies such as using potentially dangerous secondary heating equipment (e.g., stove, ovens, or space heaters) to compensate for failing heating systems (Hernández, Phillips, and Siegel 2016). These coping measures can compromise safety by creating fire hazards and/or increasing exposure to toxic gasses such as carbon monoxide.

Similar research on water burdens has recently emerged. The Environmental Protection Agency measures affordable water bills as below 4.5% of income: 2.5% for water and 2% for wastewater services (Kane 2018). Understanding that the percentage of income devoted to an expenditure is "more important" to a household as income decreases, Colton (2020) developed a range of affordable water burdens based on the ratio of income to Federal Poverty Level (FPL). For those between 0%-200% FPL, the affordable water burden range is 3-4.5%. The base level of affordability was set at 4%. Colton applied this analysis to 12 cities and found that all were in the midst of a water affordability crisis. Water and sewage prices had grown by an average of 80% between 2010 and 2018, and in some cities 40% of residents lived in neighborhoods with unaffordable bills. The research also found that the water affordability crisis is likely to get much worse, with bills in many cities becoming unaffordable (>4%) for the majority of low-income households over the next decade.

NATIONAL UTILITY AFFORDABILITY PROGRAMS AND POLICIES

Household energy is central to maintaining an individual's well-being, yet even before the pandemic, one in three U.S. households experienced some difficulty affording their energy bills (EIA 2018). In 2017, nearly 25% of U.S. households experienced high energy burdens (>6%), and 13% faced a severe energy burden (>10%); similarly, 67% of low-income households nationally faced a high energy burden, and 60% of those households faced a severe energy burden (Drehobl, Ross, Ayala 2020).

Currently, the need for assistance outpaces the national resources available to support highly burdened households. Many of the funds and services available through the Department of Health and Human Services' (HHS) Low Income Home Energy Assistance Program (LIHEAP) and the Department of Energy's (DOE) Weatherization Assistance Program (WAP) reach a small fraction of households that are income qualified. In 2018, about 30 million households qualified for LIHEAP benefits and only about 20% (6 million) of those households received them (NEADA 2018). Through DOE and other leveraged funding sources (such as HHS and state and city funds), WAP typically serves about 100,000 homes per year (NASCSP 2020). Based on this rate, it would take 360 years to weatherize all eligible households in the U.S. (Drehobl, Ross, Ayala 2020; NASCSP 2020). The public health crisis and recession are continuing to increase the need for bill assistance and weatherization.

Several states, including the District of Columbia, California, Colorado, New York, and Minnesota, have solar policies that expand and encourage low-income participation in solar photovoltaics (PV). But despite efforts to increase participation from low-income communities at the state level, many low-income households continue to face barriers to accessing the benefits of solar energy. A recent study found that on average, Black-, Hispanic-, and Asian-majority census tracts had significantly less rooftop PV installation compared to white-majority census tracts (Sunter, Castellanos, and Kammen 2019). Even after accounting for home ownership and income, the study found that significant racial disparity remains (Sunter, Castellanos, and Kammen 2019).

Water affordability is a growing issue nationally as aging infrastructure, fluctuating population growth, regulatory compliance, and the impact of climate change are leading some water utilities to increase their rates to cover their increased costs (Bipartisan Policy

Center 2017). Many low-income renters may not see the direct impact of rising water costs on their own finances because the cost of water is incorporated in their rent. In these cases, rising water costs often contribute to increases in rent, higher housing cost burdens, and housing instability (Joint Center for Housing Studies 2020).

In March 2021, the US Department of Health and Human Services announced the Low-Income Home Water Assistance Program (LIHWAP) as part of the Consolidated Appropriations Act of 2021 (NEADA 2021). LIHWAP will provide federal funding for water assistance, similar to LIHEAP. The program will provide grants to assist low-income households who spend "a high proportion of household income for drinking water and wastewater services," by providing funds to owners or operators of public water and wastewater facilitates to reduce arrearages (HHS 2021). This will be the first large scale federal program to offer water assistance, which has historically left support for water affordability to water utilities, local governments, and nonprofits. LIHWAP will provide much needed support.

Many income-eligible families are often unaware of water assistance programs, unfamiliar with the application process, and/or have feelings of mistrust or stigma associated with receiving financial assistance. Additionally, some low-income households face barriers to program participation, such as lacking internet or phone access to complete the application or not directly receiving a water bill due to living in a master-metered building or being a renter (EPA 2016). While many water assistance programs assist homeowners and do not provide support for renters, DC Water recently launched a new program to support multifamily building tenants (see next section for more details).

In addition to water bill assistance, leak reduction programs can help lead to long-term water affordability (Wong et al. 2014). Often, high bills are the result of a household leak, and programs that can identify and address these leaks can mitigate subsequent high bills. Some water utilities offer programs to alert customers of high bills. For example, DC Water has a High Usage Notification Alert (HUNA) system, which can let customers know if they have high use and a potential water leak. Some water utilities pair leak repairs with water efficiency programs and water bill discounts, helping to optimize the effectiveness of water affordability benefits. Leak programs come in a few forms, such as deploying home kits that include leak detection devices, offering a comprehensive leak detection routine program, or providing financial assistance for in-home leak repairs (Wong et al. 2014).

DISTRICT UTILITY AFFORDABILITY POLICIES AND PROGRAMS

In 2012, the District announced its Sustainable DC Plan, with ambitious citywide climate and energy goals. Since then, the District's clean energy policies and programs have expanded and changed. The District published the initial draft of the Clean Energy DC Plan in November 2016 and the final plan in August 2018. The recent adoption of the Clean Energy Omnibus Amendment Act of 2018 introduces ambitious new policies and initiatives focused on the District's energy supply, energy use, and greenhouse gas emission from vehicles. As a result, the District has implemented and expanded the number of programs that aim to create new jobs and reduce household energy use and costs, all while prioritizing community development investments (District of Columbia DOEE 2020). The District is committed to embedding equity and affordability considerations into climate and

energy actions, policies, and priorities, and hopes to achieve this by engaging and supporting residents who have been traditionally excluded from the energy planning process (District of Columbia DOEE 2018).

Energy and Water Affordability Programs in the District

DOEE, DC Water, the District of Columbia Sustainable Energy Utility (DCSEU), energy utilities, and nonprofits offer programs that aim to help District residents reduce their energy and water bills. Table 4 summarizes these various programs that address energy and water affordability by providing residents with utility bill discounts, home upgrades, repairs and weatherization, and renewable energy options. See Appendix A for more detailed descriptions of utility affordability programs serving District residents.

Table 4. Energy and water assistance programs offered by DOEE, DC Water, DCSEU, and local nonprofits

Program	Program implementer	Income qualification limit
Utility discounts		
Low Income Home Energy Assistance Program (LIHEAP)	DOEE	60% SMI
Utility Discount Program (UDP)	DOEE	60% SMI
Clean Rivers Impervious Area Charge (CRIAC) Residential Relief Program	DOEE & DC Water	100% AMI
Multifamily Assistance Program (MAP)	DC Water	60% SMI
Residential Aid Discount Program (RAD)	PEPCO	60% AMI
Residential Essential Service (RES)	Washington Gas	60% AMI
Washington Gas Budget Plan	Washington Gas	No limit
Washington Area Fuel Fund (WAFF)	Salvation Army	60% SMI
Serving People by Lending a Supporting Hand (SPLASH)	Greater Washington Urban League (GWUL)	60% SMI
PEPCO Energy Assistance	GWUL	60% SMI
Energy savings		
Solar for All (SFA)	DOEE	80% AMI
DCSEU rebates	DCSEU	No limit
Home upgrades, repairs, and weatherization		
Weatherization Assistance Program (WAP)	DOEE	60% SMI
Emergency HVAC	DOEE	60% AMI
Senior StayCool	Department of Aging and Community Living (DACL)	60% AMI
Lead-Based Paint Hazard Control Program (LHC)	DOEE	80% AMI
Lead Pipe Replacement Assistance Program (LPRAP)	DOEE & DC Water	No limit

DOEE offers direct bill relief to income-qualified residents. Funding for this assistance comes from three sources, including LIHEAP, the Energy Assistance Trust Fund (EATF), and District local funds. DOEE also automatically qualifies income-qualified LIHEAP households for three utility discount programs to lower monthly bills for customers: PEPCO's Residential Aid Discount Program (RAD), Washington Gas's Residential Essential Service (RES), and DC Water Customer Assistance Program (CAP). For higher income thresholds, DOEE also approves households for CAP2 and CAP3, part of the CRIAC Residential Relief Program, and the Solar for All program. Additional funds administered by area nonprofits can also provide supplemental support, though program funding for DOEE and utility programs may be more consistent due to regulatory and legislative requirements.

DOEE's Affordability and Efficiency Division also offers weatherization, emergency HVAC, and lead pipe replacement programs. The WAP program is implemented by two community-based organizations. During the pandemic, DOEE partnered with the District's Department of Aging and Community Living (DACL) to offer a senior cooling program. Income qualification across all the programs varies due to funding source. Programs with federal funding have stricter requirements, which can make it challenging to cross enroll households while also meeting these federal reporting and documentation requirements.

In February 2021, DC Water launched a new Multifamily Assistance Program (MAP), which aims to support tenants who pay for their water bills through their rent. The MAP program provides benefits to building owners or HOAs of multifamily affordable housing properties (i.e., four or more units). Building owners can apply for the program, and DC Water will provide a credit to the property's water service account. The HOA or owner is then required to post 90% of the credit to the qualifying occupant's rental or HOA account in order to provide the benefits back to income-qualified tenants (DC Water 2021b).

The city is working to embed and ensure equity in all energy actions and programs. DOEE has begun several innovative efforts to build capacity with local groups. For example, in 2020, DOEE hired a new staff member who will be dedicated to engaging with the community on energy issues and to ensuring that equity is at the forefront of energy planning and programs (meeting with DOEE staff, February 2, 2021). In addition, DOEE was awarded an equity grant from the Urban Sustainability Directors Network in partnership with the Consumer Health Foundation to develop a racial equity assessment tool (District of Columbia DOEE 2020). DOEE will use the tool in the form of processes to assess policies, plans, and programs through a racial equity lens.

DOEE Utility Affordability Program Outcomes and COVID Impacts

The pandemic has affected utility assistance and affordability program enrollments. The stay-at-home order closed down in-person enrollment centers and in-person outreach events. Across energy assistance programs, including LIHEAP, RAD, and RES, enrollment was down in FY20 compared to FY19. While WAP funds were spent in FY20, LIHEAP enrollment was down by about 25% (meeting with DOEE staff, February 2, 2021). DOEE also worked to leverage additional programs alongside WAP, such as the Senior StayCool program and efforts to integrate lead removal. WAP pivoted to spending additional funding on health safety and PPE, while continuing to perform the same audit and evaluation

process. In addition, although enrollment is down for these assistance programs, more households are income eligible due to job losses and income changes. Table 5 includes total program participants in FY2019 and FY2020 across all five utility assistance programs and two energy utility assistance programs.

Table 5. Total program participants in FY2019 and FY2020

Program	FY2019	FY2020
LIHEAP	20,236	15,779
RAD	18,938	14,690
RES	9,019	7,017
WAP*	360	297
CRIAC (CAP, 2, and 3)	3,599	4,651
SFA	815	3,103

Data provided by DOEE through email. * Number of households receiving energy efficiency services (e.g., WAP, Senior StayCool, emergency HVAC repairs).

In contrast, both CRIAC and SFA enrollments have continued to increase, with FY21 enrollment on track to be at least twice as high as FY20. Both CRIAC and SFA are newer programs and are continuing to ramp up enrollment and capacity each year. For FY21 (as of January 2021), SFA has enrolled an additional 1,709 program participants, putting enrollment on track to at least double if not triple compared to FY20 (data from DOEE meeting on February 2, 2021). But even as interest in the SFA program remains steady, it is now more difficult to interface with potential subscribers due to COVID, which makes it more difficult for residents to sign up. DOEE currently relies on mailers for new SFA subscriptions, whereas before the pandemic, DOEE staff enrolled about 30–40% of sign-ups through energy enrollment centers (Mackenzie Mathews, in email to Ariel Drehobl, January 25, 2021).

Table 6 shows a summary of CRIAC participants across the three Customer Assistance Program (CAP) levels and the new emergency assistance program in FY19 and FY20. The Emergency Residential Relief Program (ERRP) benefit was established through the COVID-19 Response Supplemental Emergency Amendment Act of 2020 in response to increased average customer arrears in FY21.[7] CRIAC CAP 3 is now serving substantially more people than before the pandemic: as of January 2021, CRIAC has assisted almost as many residents in FY21 as in the entirety of FY2020. CRIAC wait times have not increased due to the COVID-19 pandemic, and DOEE continues to respond to new applications within 1–2 business days (with up to 10 business days for very busy times).

[7] COVID-19 Response Supplemental Emergency Amendment Act of 2020. 2020. D.C. Act 23-286. code.dccouncil.us/dc/council/acts/23-286.html.

Table 6. Number of DOEE customer approvals for CRIAC (CAP, 2, and 3) and Emergency Water Assistance Programs in FY19, FY20, and FY21 (as of January)

Year	CAP 1	CAP 2	CAP 3	EERP
FY19	3,294	256	49	N/A
FY20	3,991	519	141	2,200
FY21 (as of Jan)	2,141	359	124	1,155

Data provided by email from DOEE on January 25, 2021.

Overall, the COVID-19 pandemic has exacerbated energy, water, and housing insecurity for the District's low- and moderate-income communities. Black and Hispanic District residents are especially affected by the pandemic: they have the highest unemployment rates, highest food and housing insecurity, and are more likely to experience homelessness or displacement. Energy and water affordability programs geared to the most overburdened households can support a fair and just recovery in the District by supporting residents who face systemic inequities before and during the pandemic (Bohr and McCreery 2019). Policymakers and program administrators have the opportunity to reevaluate and enhance the process by which energy and water savings measures and bill assistance are distributed to ensure that they support the most overburdened communities in a fair and equitable manner (Reames, Reiner, and Stacy 2018).

Energy and Water Burden Analysis

Despite the number of utility affordability programs offered, many District residents experience disproportionately high energy and water burdens. This utility burden analysis provides an overview of how energy and water burdens differ for many households in the DC metropolitan statistical area (MSA).[8] DOEE can use this information to better understand which groups who do not currently receive utility assistance experience disproportionately high utility burdens in order to better target utility affordability resources towards these communities and households.

METHODOLOGY

This analysis follows the methodology used in ACEEE's three energy burden reports (Drehobl, Ross, and Ayala 2020; Ross, Drehobl and Stickles 2017; Drehobl and Ross 2016). The study analyzes the American Housing Survey (AHS) 2019 data (released in October 2020), issued by the U.S. Department of Housing and Urban Development (HUD) for the national population and for the Washington, DC metropolitan statistical area (MSA). The AHS includes household-level income data and energy and water cost data that we use as the basis of our energy, water, and combined burden calculations.

[8] The DC metro area includes Washington, DC, Arlington, and Alexandria. For more information, see: www.census.gov/programs-surveys/ahs/tech-documentation/help-guides/2015-later/metro_oversamp_hist_2015.html.

See Appendix B for the full description of the utility burden methodology and Appendix C for full utility burden data tables.

For the utility burden analyses, we calculated energy burdens using the total annual cost of electricity, natural gas, and other heating fuels and total annual household income. We define households with high energy burdens as those spending more than 6% of their income on electricity and heating fuel costs, and households with severe energy burdens as those spending more than 10%.[9] These two categories are not mutually exclusive, as households with severe energy burdens are a subset of those who have high energy burdens. We calculated median water burdens for households in the DC metro area, and then high water burdens as households spending more than 4% of their income on water bills. For households with both water and energy data available, we calculated a combined energy and water burden, and we calculated high combined burdens as those above 10% of household income.

We analyzed energy, water, and combined burdens across a variety of factors including race and ethnicity, age, education and ability, building tenure and age, and building type and heating fuel. Figure 2 includes the demographic and housing-related groups included in the analyses. We chose income thresholds to match those of DOEE's utility affordability program. For each analysis, we filtered out households who do not directly pay for their energy and/or water bills and report a positive income. We also calculated energy, water, and combined burdens for the 2019 AHS national sample to compare to the DC metro area burden findings.

The dataset does not let us separate households who receive utility assistance and those who do not. Therefore, these utility burden findings are representative of the DC metro area as a whole, and likely include some households who receive assistance along with mostly households who do not receive assistance. We recommend viewing these findings as guidance on which households may be most in need of assistance for targeting and outreach purposes. See Appendix B for additional limitations of this study.

[9] HUD determines affordable housing costs to be 30% of total household income. Researchers have determined that, typically, 20% of total housing expenses are energy costs. This equates to 6% of total income spent on energy bills as an affordable level (Fisher, Sheehan & Colton 2020). We consider energy burdens above 6% to be high burdens, with burdens above 10% to be severe. This method is in line with other research (APPRISE 2005).

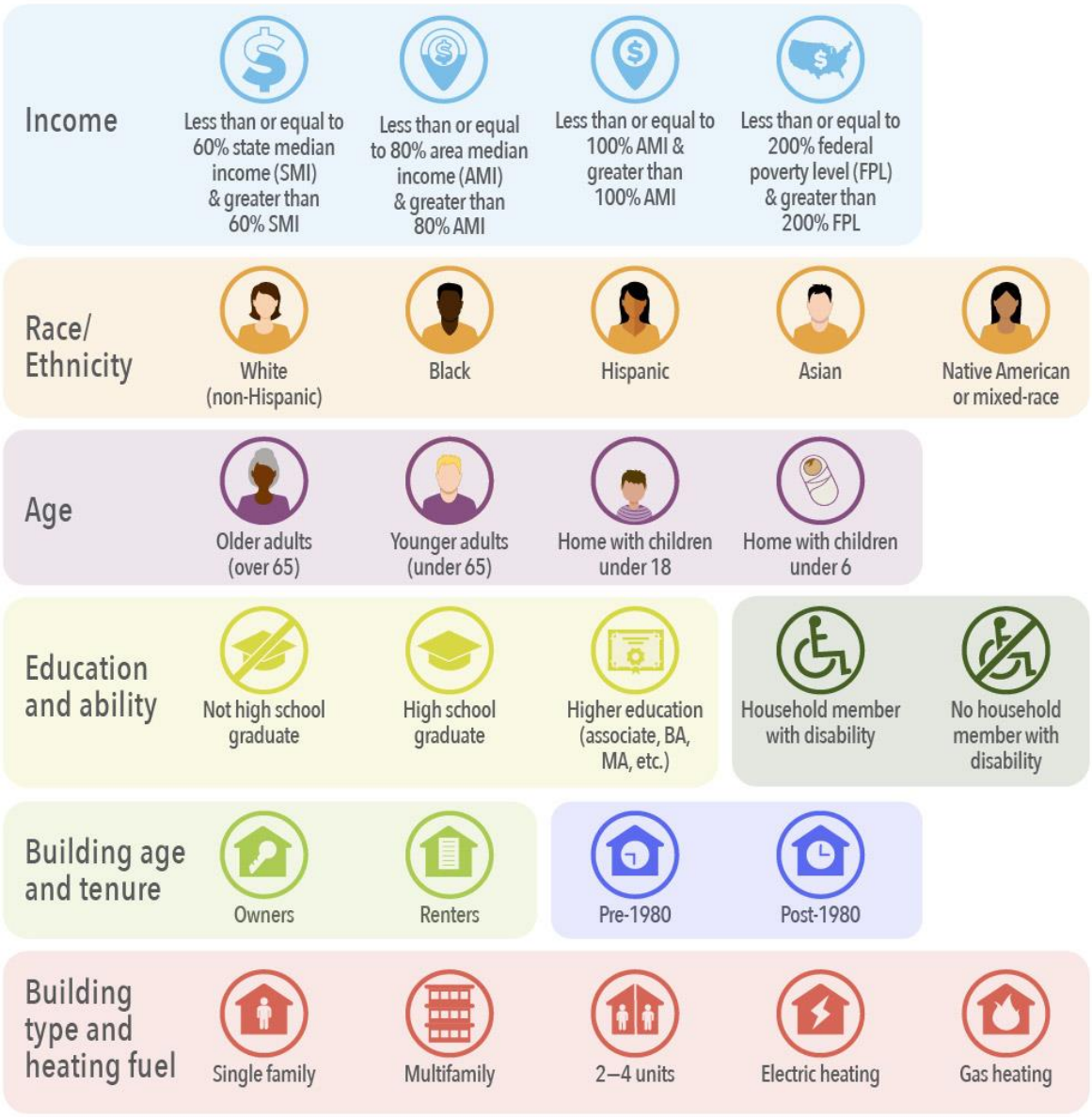


Figure 2. Demographic and housing factors analyzed across the energy, water, and combined utility burden analyses, including race/ethnicity, age, education, ability, building tenure and age, and building type and heating fuel. *Source:* data from 2019 American Housing Survey.

ENERGY BURDENS FINDINGS

We analyzed the DC metro area energy burdens across demographic and building categories and found that the groups with disproportionately high burdens reflect households with physical and socioeconomic factors that exacerbate their energy burden, such as having low incomes, living in older buildings, and facing longstanding systemic

inequities.[10] We also analyzed what percentage of each group experience a high and severe energy burden. These energy burdens reflect the landscape of households in the DC metro aera, most of whom do not receive energy assistance. Figure 3 includes the median energy burdens across demographic and housing type groups.

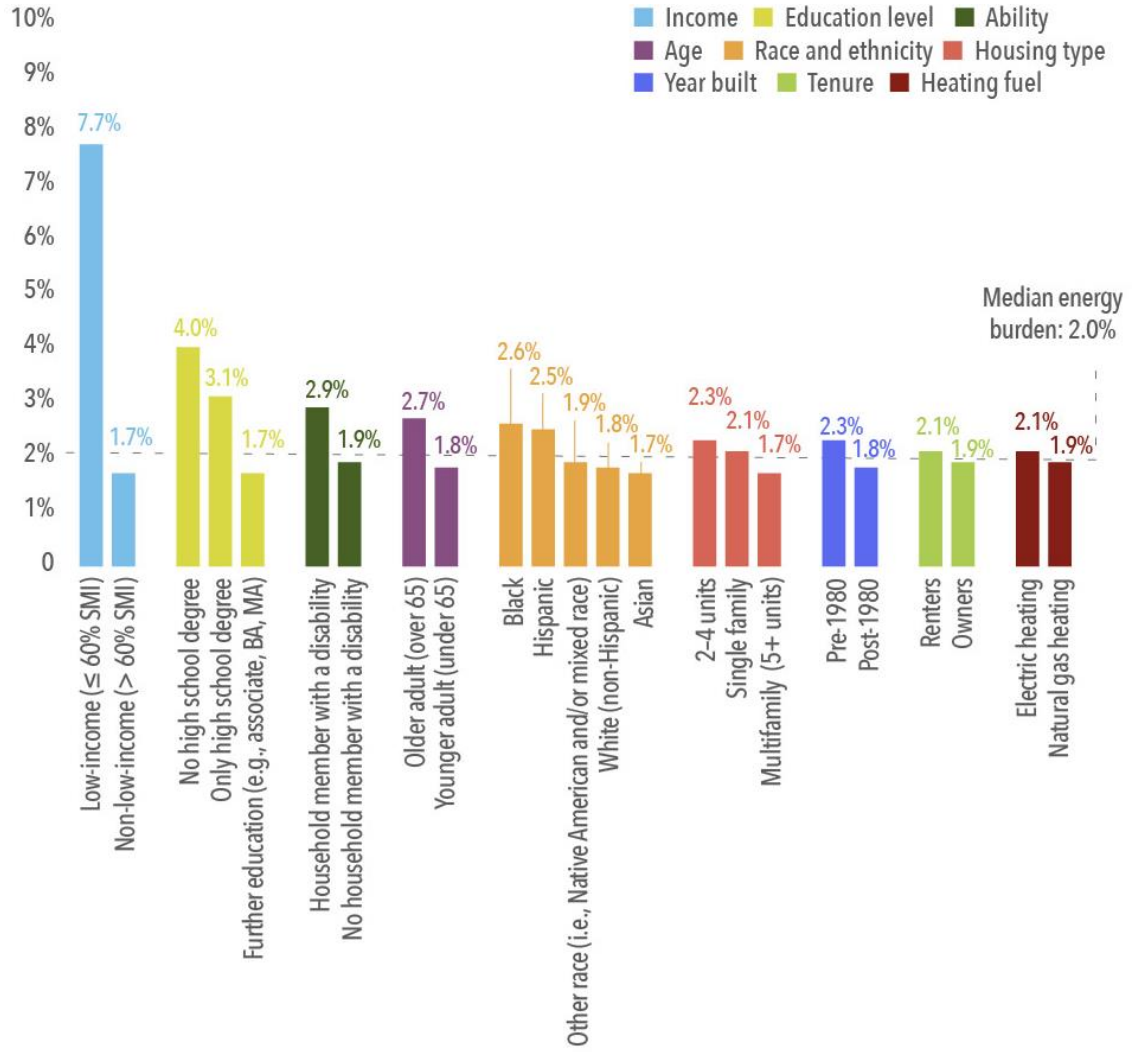


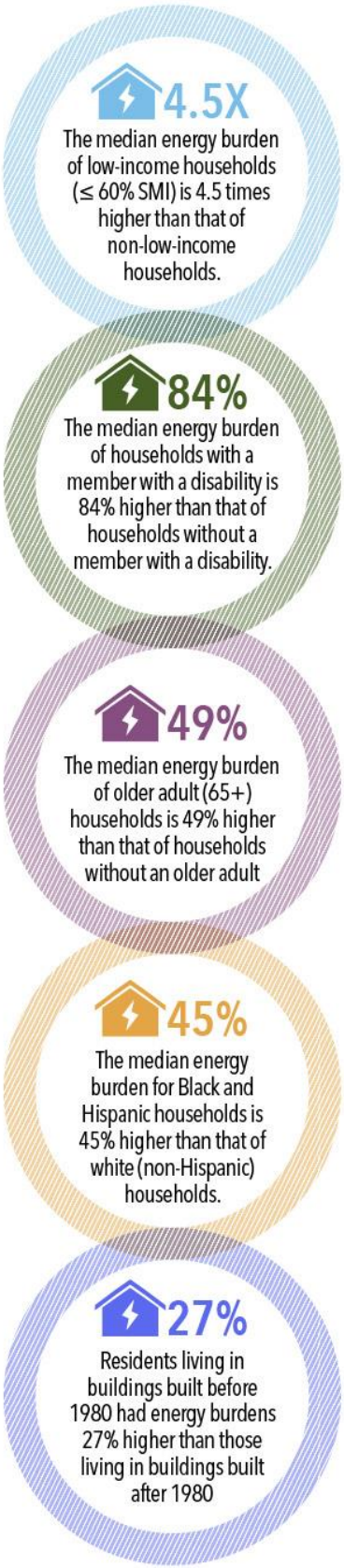
Figure 3. Energy burdens (i.e., electricity and heating fuel costs as a percentage of total income) across subgroups of houses in the DC metro area, including income, education level, ability, age, race and ethnicity, housing type, year built, tenure status, and heating fuels. *Source:* data from 2019 American Housing Survey.

[10] Note that for the energy burden analysis, we analyze the DC metro area population of the AHS dataset who directly pay for their electricity and main heating fuel (i.e., electricity, natural gas, or other) and report positive income. Households who do not directly pay for their energy are excluded from this analysis.

Main DC metro area energy burden findings include[11]

- Across all households in the DC metro area, 64% of low-income households face a high energy burden (above 6%), and 40% of low-income households face a severe energy burden (above 10%).
- One-fourth (25%) of low-income households experience an energy burden of at least 15%, which is 7.5 times the median for the DC metro area.
- Groups with above-median energy burdens in the DC metro area include low-income households, households who receive food stamps, non-high school graduates, households with a family member with a disability, adults over 65, Black households, Hispanic households, and renters.
- Households with electric heat and natural gas heat did not experience major differences in energy burdens (2.1% for electric, 1.9% for natural gas).[12]

The graphics to the right illustrate the greatest disparities between groups in the energy burden analysis. For example, the median low-income household experiences an energy burden 4.5 times higher than the median non-low-income household.



Energy Bills:
Of households who directly pay for their energy bills (excluding those who pay for energy in rent), the median household in the DC metro area spends **$2,160** annually on electric and heating bills. While the median low-income household spends less ($**1,716** on annual electric and heating bills), low-income families typically live in less efficient buildings. So even though they are spending less overall, they are often spending more per square foot as well as a greater portion of income on these bills.

Energy Burdens by Income Threshold

We analyzed energy burdens by income thresholds that align with DOEE's utility affordability program qualification levels. Among these groups, households at or below 200% FPL

[11] These findings are based on data found in Appendix C.

[12] This finding differs from findings in the 2020 APPRISE LIHEAP Energy burden analysis (APPRISE 2020). We recommend further research into the impact of heating fuel type on energy burdens in the District.

experienced the highest energy burdens. The median household at or below 200% FPL had an energy burden 2.6 times higher than the median household at 100% AMI. Some of the most vulnerable groups across all low-income levels include homeowners, older adults, single-family households, Black households, and households with a member with a disability. Table 7 shows the median energy burden and the percentage of those with high and severe energy burdens across other income thresholds.

Key takeaways related to income include[13]

- Even as households with the lowest incomes (i.e., 200% FPL) have the highest energy burdens, those with low to moderate incomes (i.e., 100% AMI) also have disproportionately high energy burdens.
- Energy burdens for low-income groups were higher than for comparable non-low-income groups. Households with income at or below
    - 200% FPL had burdens 5.7 times higher
    - 60% SMI had burdens 4.5 times higher
    - 80% AMI had burdens 3 times higher
    - 100% AMI had burdens almost 3 times higher[14]
- One-fourth of households with incomes less than
    - 200% FPL had an energy burden above 17%
    - 60% SMI had an energy burden above 15%
    - 80% AMI had an energy burden above 7.7%
    - 100% AMI had an energy burden above 6.6%

  These burdens are 8.5 to 3.3 times higher than the metro area median of 2%.
- Almost three-quarters of the lowest income households (200% FPL) and almost one-third of low- to moderate-income households (100% AMI) experienced a high energy burden.

[13] These findings are based on data found in Appendix C.

[14] These findings are comparisons of each low-income group to its corresponding non-low-income group. For example, ≤200% FPL households are compared to >200% FPL.

Table 7. Median energy burden and percent of households with high (>6%) and severe (>10%) energy burdens across low-income and non-low-income groups.

Income thresholds	Program(s)	Number of households in DC metro area	Percent of households in DC metro area	Median energy burden	% high burden (>6%)	% severe burden (>10%)
≤200% FPL	N/A	273,055	14%	9.8%	73%	48%
≤60% SMI	LIHEAP, UDP, WAP	331,821	18%	7.7%	64%	40%
≤80% AMI	SFA	668,468	35%	4.5%	36%	20%
≤100% AMI	CRIAC	842,284	45%	3.8%	29%	16%
>200% FPL (non-low-income)	N/A	1,611,601	86%	1.7%	3%	0%
>60% SMI	N/A	1,552,834	82%	1.7%	2%	0%
>80% AMI	N/A	1,216,188	65%	1.5%	0%	0%
>100% AMI	N/A	1042,372	55%	1.4%	0%	0%
All households	N/A	1,884,656	100%	2.0%	13%	7%

National Energy Burden Comparison

We found similar patterns of disproportionately high energy burdens across all categories when comparing national energy burdens to DC metro area energy burdens. Table 8 shows median energy burdens and the percentage of households with a high energy burden across groups in the DC metro area and nationally. Energy burdens were relatively lower across almost all groups in the DC metro area compared to the national sample, though the data did show that the same groups (i.e., Black, Hispanic, older adults, renters) experience disproportionately high burdens.

The one category in which the median energy burden was higher and more households experienced a high burden in the DC metro area was for low-income households (≤200% FPL). The DC metro area median low-income energy burden was 24% higher compared to the national median low-income burden, and there was also a larger gap between low-income and non-low-income energy burdens in the DC metro area. This suggests that the low-income households who do not receive utility assistance experience more acute energy burdens in the District as compared to the nation, and suggests that income inequality, inefficient housing stock, and access to energy and water support programs may contribute to the disproportionately high low-income energy burdens. With many District residents experiencing massive job losses, reduced incomes, and potentially higher energy bills resulting from the public health pandemic, the low-income energy burden comparison is likely even more stark.

Table 8. Median energy burden and percent of households with high (>6%) energy burdens across different categories and subgroups in the DC metro area and nationally

Category	Subgroup	DC metro energy burden median	% high burden DC metro (>6%)	National energy burden median	% high burden nationally (>6%)
	All households	2%	13%	2.7%	18%
Income	Low-income (≤200% FPL)	9.8%	73%	7.9%	67%
	Non-low-income (>200% FPL)	1.7%	3%	2.1%	7%
Race/ ethnicity	Black	2.6%	21%	3.8%	31%
	Hispanic	2.5%	13%	2.8%	19%
	Asian	1.7%	7%	2.1%	12%
	Other (Native American and mixed race)	1.9%	17%	2.5%	18%
	White (non-Hispanic)	1.8%	10%	2.5%	16%
Age	Older adults (over 65)	2.7%	22%	3.5%	29%
	Younger adults (under 65)	1.8%	10%	2.5%	14%
Tenure	Renters	2.1%	16%	3%	23%
	Owners	1.9%	12%	2.5%	16%
Building age	Built before 1980	2.3%	16%	3%	22%
	Built after 1980	1.8%	11%	2.2%	14%
Building type	Single-family	2.1%	13%	2.6%	17%
	Multifamily	1.7%	12%	2.5%	17%

WATER BURDEN FINDINGS

The water burden analysis showed similar trends to the energy burden analysis.[15] Energy burdens on average were about three times higher than water burdens across categories. Even so, we found that many groups experienced disproportionately higher water burdens than others, and that water costs can prove significant for many households. For example, both low- and moderate-income households, most of whom likely do not receive utility assistance, experience disproportionately high water burdens compared to the average household. This indicates that these households may be in need of water efficiency and bill payment support. Figure 4 includes the median water burdens across demographic and housing type groups.

[15] Note that for the water burden analysis, we analyze the DC metro area population of the AHS dataset who directly pay for their water bill and report positive income. This filters the data set differently than for the energy burden analysis. Both analyses do not include households who do not directly pay for their energy and/or water bills.

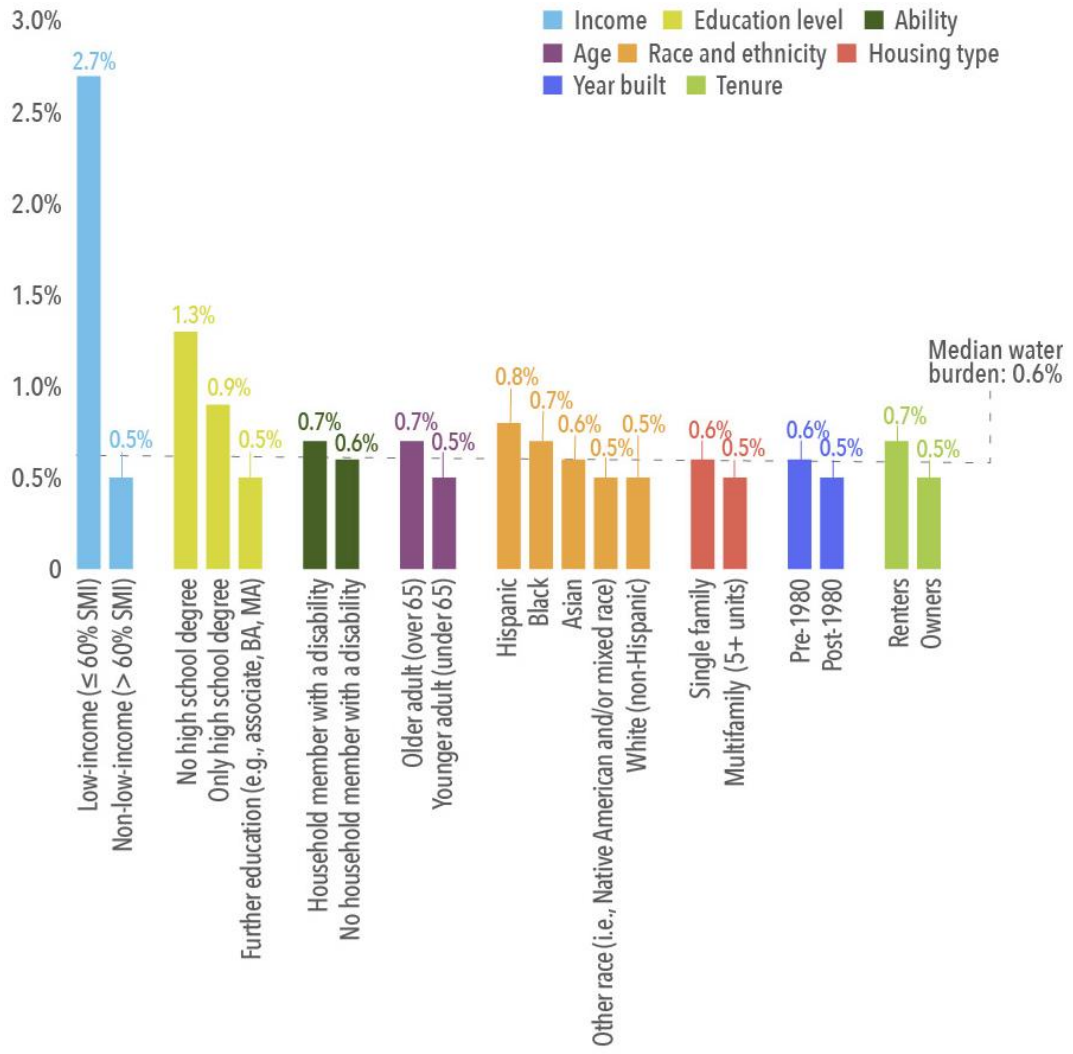


Figure 4. Water burdens (i.e., water costs as a percentage of total income) across subgroups of households in the DC metro area, including income, education level, ability, age, race and ethnicity, housing type, year built, tenure status, and heating fuels. *Source:* data from 2019 American Housing Survey.

Main DC metro area water burden findings include[16]

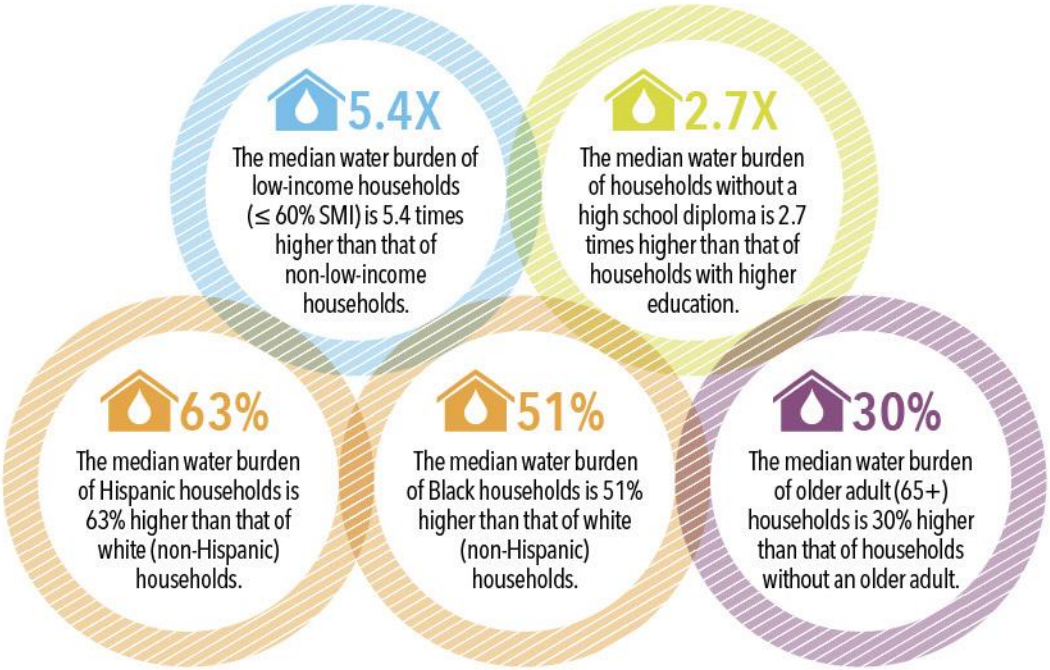
- Low-income households have a median water burden that is 4.5 times higher than the metro area median; similarly, low- to moderate-income households (≤100% AMI) have a median water burden that is about 2 times higher.
- One-fourth of low-income households experienced a water burden of at least 7.4%, which is more than 12 times the metro median water burden.
- 38% of low-income households and 10% of older adult households experience a high water burden above 4%.

[16] These findings are based on data found in Appendix C.

- Groups with above-median water burdens include low-income households, non-high school graduates, households who receive food stamps, high school graduates without higher/additional education, Hispanic households, Black households, older adults, households with a member with a disability, renters, and households in older buildings.

Water Bills:
Of those that directly pay for their water bills, the median household in the DC metro area spends **$1,980** annually on water bills. While the median low-income household spends less ($**720**) on annual water bills, low-income families are spending a greater portion of their income on this cost.

The graphic below illustrates the greatest disparities between groups in the water burden analysis.



National Water Burden Comparison

For water burdens, the disparities among groups in the DC metro area reflect the disparities found nationally. As with energy burdens, water burdens were also lower compared to national levels, though the DC metro area had a similar percentage of low-income households (≤200% FPL) with high water burdens compared to national levels (i.e., 45%). Table 9 includes median water burdens and the percentage of households with a high water burden (>4%) in the DC metro area and nationally.

Table 9. Median water burden and percent of households with high (>6%) energy burdens across different categories and subgroups in the DC metro area and nationally

Category	Subgroup	DC metro water burden median	% high burden DC metro (>4%)	National water burden median	% high burden nationally (>4%)
	All households	0.6%	6%	0.9%	9%
Income	Low-income (≤200% FPL)	3%	45%	3.4%	44%
	Non-low-income (>200% FPL)	0.5%	1%	0.8%	2%
Race/ ethnicity	Black	0.7%	8%	1.4%	18%
	Hispanic	0.8%	8%	1.1%	11%
	Asian	0.6%	4%	0.8%	9%
	Other (Native American and mixed race)	0.5%	6%	1.2%	7%
	White (non-Hispanic)	0.5%	4%	0.9%	8%
Age	Older adults (over 65)	0.7%	10%	1.4%	15%
	Younger adults (under 65)	0.5%	4%	0.8%	7%
Tenure	Renters	0.7%	6%	1.1%	13%
	Owners	0.5%	5%	0.9%	8%
Building age	Built before 1980	0.6%	8%	1.1%	11%
	Built after 1980	0.5%	4%	0.8%	6%
Building type	Single-family	0.6%	6%	0.9%	9%
	Multifamily	0.5%	6%	0.9%	10%

COMBINED UTILITY BURDEN FINDINGS

Combined energy and water utility burdens illustrate a more comprehensive picture of household utility costs.[17] This analysis finds that similar groups are highly burdened by these bills. Figure 5 shows the median combined energy and water burdens across demographic and housing type groups.

[17] Note that for the combined burden analysis, we analyze the DC metro area population of the AHS dataset who directly pay for their electricity, main heating fuel, and water costs, as well as report positive income. This means the subset of the population included in this analysis differs from that of the energy and water burden analyses.

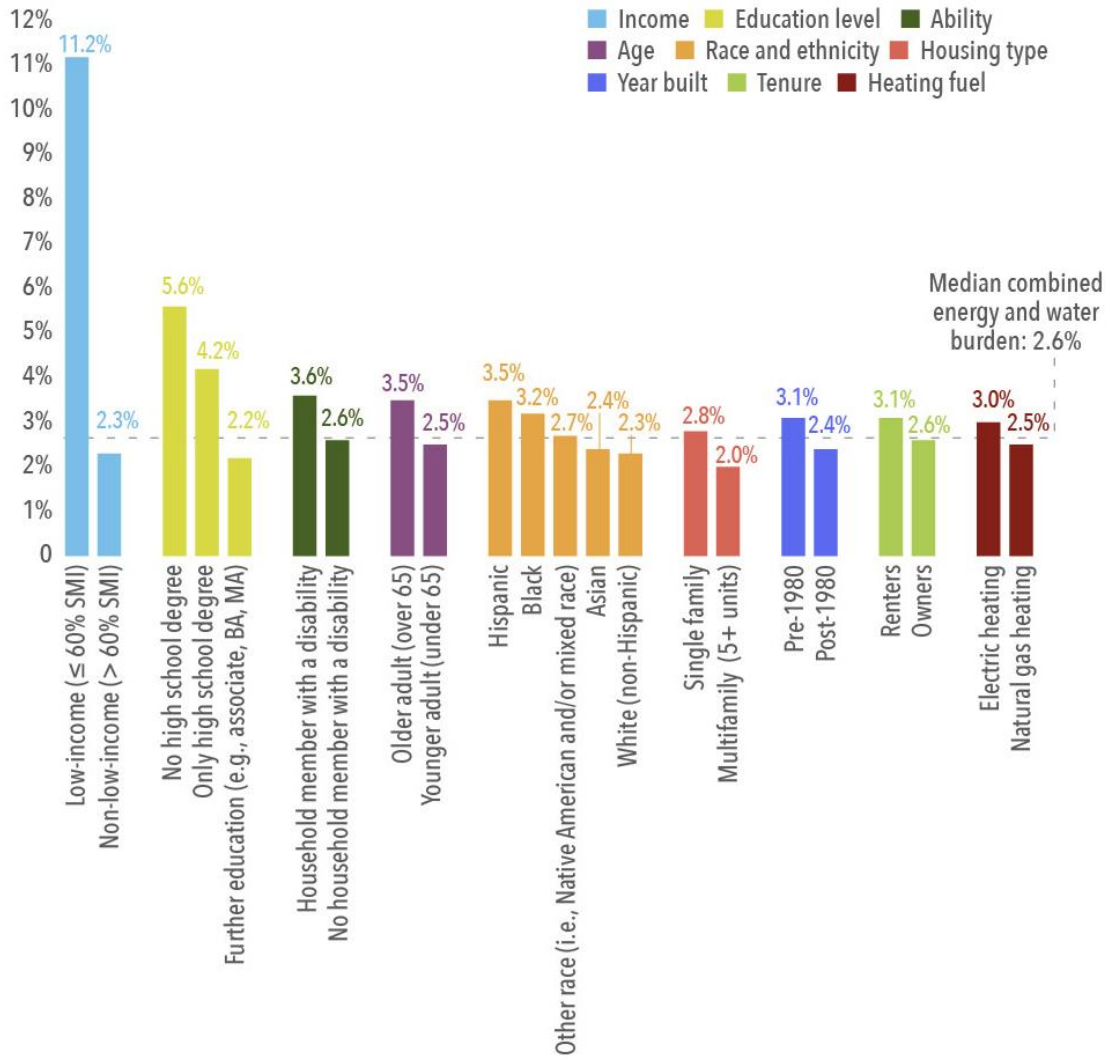


Figure 5. Combined energy and water burdens (i.e., electricity, heating fuel, and water costs as a percentage of total income) across subgroups of households in the DC metro area, including income, education level, ability, age, race and ethnicity, housing type, year built, tenure status, and heating fuels. *Source:* data from 2019 American Housing Survey.

Main combined energy and water burden findings include[18]

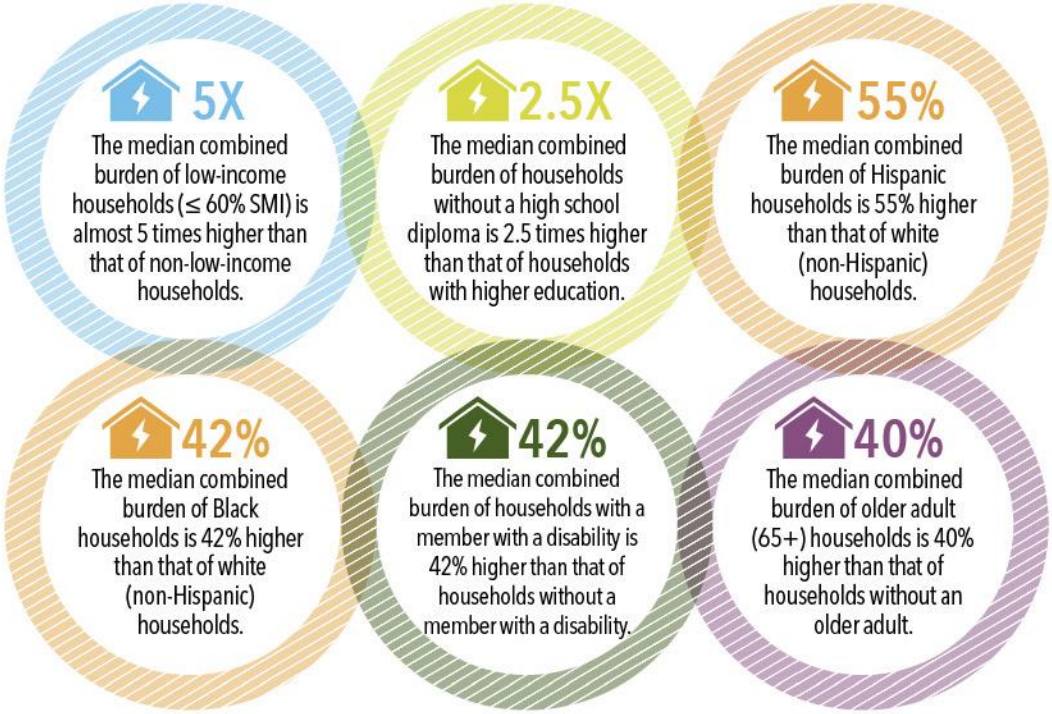
- Taken together, the median combined energy and water burden accounts for up to 11.2% of income for low-income households, which is 4.3 times higher than the combined burden for the median household.
- One-fourth of low-income households experienced a combined energy and water burden of at least 23%, which is almost 9 times the metro median combined burden. This means that one-quarter of low-income households are spending almost one-quarter of their income on their energy and water utility bills.

[18] These findings are based on data found in Appendix C.

- 58% of low-income households experienced a high combined utility burden, as did 26% of households without a high school degree, 16% of households with a member with a disability, 14% of older adult households, and 13% of Black households.
- Groups with above-median combined energy and water burdens include low-income households, non-high school graduates, households with a member with a disability, Hispanic households, older adult households, Black households, renters, households in pre-1980 buildings, and households with electric heat.

Combined Energy and Water Bills:
The median household in the DC metro area that directly pays for both energy and water bills (excluding those who have these bills included in rent) spends **$3,240** annually on these bills. The median low-income household that directly pays for energy and water bills similarly spends $**3,000** annually.

The graphic below illustrates the greatest disparities between groups in the combined energy and water burden analysis.



National Combined Utility Burden Comparison

The combined utility burdens in the DC metro area mirrored the national energy burdens, as all categories showed similarly disproportionate burdens, with only low-income (≤200% FPL) households having higher combined burdens than the national median. Low-income utility burdens were slightly higher at 14.4% as compared to 12% nationally, with 66% of low-income DC households experiencing a high combined burden of greater than 10% compared to 62% nationally. Table 10 shows median combined utility burdens and the

percentage of households with a high combined burden (>10%) in the DC metro area and nationally.

Table 10. Median combined energy and water burden, and percent of households with high (>10%) energy burdens, across different categories and subgroups in the DC metro area and nationally

Category	Subgroup	DC metro combined burden median	% high burden DC metro (>10%)	National combined burden median	% high burden nationally (>10%)
	All households	2.6%	8%	3.5%	12%
Income	Low-income (≤200% FPL)	14.4%	66%	12%	62%
	Non-low-income (>200% FPL)	2.4%	1%	3%	2%
Race/ ethnicity	Black	3.2%	13%	5.2%	23%
	Hispanic	3.5%	8%	3.7%	11%
	Asian	2.4%	7%	2.9%	9%
	Other (Native American and mixed race)	2.7%	9%	3.8%	9%
	White (non-Hispanic)	2.3%	5%	3.4%	11%
Age	Older adults (over 65)	3.5%	14%	4.8%	21%
	Younger adults (under 65)	2.5%	6%	3.1%	9%
Tenure	Renters	3.1%	9%	4.1%	16%
	Owners	2.6%	7%	3.4%	11%
Building age	Built before 1980	3.1%	11%	4%	15%
	Built after 1980	2.4%	5%	3%	8%
Building type	Single-family	2.8%	8%	3.5%	12%
	Multifamily	2%	7%	3.3%	10%

Utility Affordability Interview Findings

Under the leadership of Dr. Diana Hernández, the research team conducted interviews of DOEE utility assistance program staff and program participants to better understand program components and the experience of energy and water assistance program users. We developed semi-structured interview guides for each stakeholder group, which were then reviewed and approved by DOEE as well as the Institutional Review Board at Columbia University. Due to COVID-19 limitations, all data were collected remotely. The interviews with program staff and administrators were conducted via Zoom, whereas participant interviews were administered via Vonage for Business, an app-based phone system that allowed the team to contact participants with a DC-based phone number and record interviews in real time.

INTERVIEW METHODOLOGY

Dr. Hernández spearheaded the development of the interview guides to reflect priorities established by DOEE. The interview team conducted interviews with 10 DOEE program staff to provide feedback about the roles of the participants, descriptions, and assessments of the programs they worked for or oversaw, their views of client experiences, and the impact of COVID on program delivery.

After completing the interviews with program staff, the project team recruited and conducted interviews with 30 recipients of DOEE utility affordability services between October and December 2020. We recruited participants across all five programs, including interviewing those who had received multiple services. Based on participant data provided by DOEE, we randomly selected participants in each program, and focused on recruiting individuals who participated in multiple programs. Participants were invited to participate in the study either through email or postcards mailed to participants' homes. The overwhelming majority of participants were recruited via email, whereas only 3 of 30 participants were successfully recruited by responding to the postcards. Respondents were provided a $100 gift card to Visa as an incentive.

See Appendix D for the full interview methodology details, including more details on our recruitment strategy and the interview and coding process. See Appendix E for the full interview guides for both participant and DOEE staff interviews. Appendix F includes additional information on interview participants.

Table 11 includes a demographic summary of program participants.

Table 11. Number of interview participants across demographic and other categories (total of 30)

		Participants (not mutually exclusive)				
Category	Subcategory	LIHEAP/UDP	WAP	SFA	CRIAC	Total (of 30)
Total participants*	N/A	24	8	17	15	30
Recruitment type	Email	21	6	15	15	27
	Postcard	3	2	2	0	3
District Ward	Wards 1–6	15	4	10	7	16
	Wards 7–8	9	4	6	7	14
Age	29 and under	2	0	1	2	4
	30–39	8	0	3	4	8
	40–49	4	2	4	4	6
	50–59	5	2	4	3	6
	60–69	2	1	2	1	2
	70–79	1	1	2	1	2
	80 and above	1	1	0	0	1
Race/ethnicity	Black/African American**	15	7	12	10	19

Category	Subcategory	Participants (not mutually exclusive) LIHEAP/UDP	WAP	SFA	CRIAC	Total (of 30)
	Hispanic	1	0	2	1	2
	White	1	0	0	2	2
	Asian	1	0	1	0	1
Tenure status	Owner	9	5	8	8	14
	Renter	9	3	8	7	15
	Other	1	0	1	0	1
Building type	Single-family	17	8	12	15	23
	Multifamily	7	0	5	0	7

* 25 of 30 participants indicated that they participated in more than one of the five programs (i.e., more than one program or more than LIHEAP/UDP), so that the number participating in each program is not mutually exclusive from other programs. Thus, the total participants for each category will not equal the sum across the programs.
** This includes households who identified as either Black, African American, or both.

Each interview lasted between 30–90 minutes, with most running close to one hour. The interview team used a semi-structured interview guide that included questions about participants' home and family, their participation in the DOEE programs (repeating pertinent questions if enrolled in multiple programs), household bills and financial management strategies, energy efficiency and indoor temperature conditions, household income and expenses, COVID-19 impact, and program recommendations. All interviews were recorded, transcribed, and coded using an open coding methodology to develop a codebook, which identified five key domains, including reasons for energy insecurity, coping strategies used to manage financial hardship and thermal discomfort, experiences with various aspects of DOEE program participation including barriers and facilitators to accessing energy assistance, and perceptions of the impact of program participation. The program staff codebook included domains of personal roles and responsibilities, program descriptions, program assessments, client experiences, and COVID-19 impacts.

Following the codebook development and open coding process, Dr. Hernández identified and assessed data patterns and potential causal relationships, contextual factors, and impacting conditions. The key findings reflect this more interpretive analytical approach, which highlights overarching themes across all participant transcripts, focusing on facets of the programs that are serving participants well along with potential areas of improvement. These insights have also been incorporated into the policy recommendations.

FINDINGS FROM QUALITATIVE INTERVIEWS

Interviews with DOEE program participants offered insights into the nature of energy insecurity and common coping responses as well as details about the experience and impact of receiving utility assistance benefits. Interviews with program staff and administrators provided an overview of DOEE's organizational priorities, recent changes and operational adaptations spurred by COVID-19 lockdowns, and recommendations for strengthening support for participants. Findings for each group are presented separately, though

recommendations in the following section reflect a synthesis of responses across both groups.

Participant Perspectives on Energy Insecurity, Coping, and the Impact of Affordability Programs

For participant interviews, we set out to answer the following questions:

1) What factors contribute to participants needing energy assistance?
2) What is the DOEE customer experience like?
3) What benefits/impacts are derived from receiving energy assistance?

We summarize the answers to these questions below through firsthand participant accounts.

Managing utility bills. Utility bills were a clear priority for most participants. Many described energy and water bills as priority household expenses, along with housing and food costs. Interviewees expressed that paying bills in full and on time was responsible and respectable. Participants felt accomplished when the bills were financially manageable (i.e., reasonably priced and affordable relative to income), and when they were able to keep up with their payments, thereby maintaining respectability and a sense of control. Despite their best efforts, however, many respondents encountered recent and/or persistent challenges paying for these essential services.

Nature of energy insecurity. Consistent with previous literature, participants reported that experiencing energy insecurity was rooted in a number of factors including events or situations that precipitated economic instability, such as the loss of employment or wages (especially due to COVID-19); changes in household composition, such as relationship dissolution or absorbing additional family members; unexpected expenses that compromised the household budget; and a disability or health issue that was costly or contributed to changes in work. Other factors included persistently low wages, fixed incomes, or difficulty accessing entitlement benefits. In addition, respondents cited poor housing quality, with dated energy infrastructure and other inefficiencies in their homes. One participant described their experience with their energy bills as follows:

> *I guess me worrying about if I will be able to pay my electric bill even though my bill is lower now. I guess me thinking about because of what's going on and how my hours have been changing. And how I've been maybe working three days a week. I'm truly worried, like, can I pay the bill? I don't want a shut off. I have a young child. I don't want to be in our home and we come home one day and the power's out. I was just thinking about her.*

Coping with energy insecurity. Participants coped with energy insecurity through several strategies, which included reducing energy use. Strategies to reduce energy use included opening windows or opting for a fan rather than running the air conditioner on hot days or setting the thermostat at a lower temperature than desired and using extra layers of clothing or space heaters to help manage the cost of heating. Some relied on a complex balancing act with bills, prioritizing and juggling household expenses, making payment arrangements with utility companies, and seeking financial assistance from family and friends to keep afloat. Many also described seeking program support through DOEE programs as a key coping strategy. The following are examples from participant interviews:

> *For me as far as layering, it really helps. It does wonders, and even using the special type of bedding that makes it a lot warmer, with lining. Clothes that have lining inside. I find that that has been really useful. Even the face coverings... If you were going outside, for instance, can be applied inside. It's the same strategies.*
>
> *Usually around about November 1st, we start putting the plastic [in] the window seals and we take them off during the summertime… And you just take those types of plastic on the windows and it [that] cuts off some drafts. We just go to the Dollar store, we get the plastic and it is Dollar store plastic, but it's better than nothing.*

Participation in DOEE programs. Participants described most program elements as generally positive, from the initial application to the annual re-enrollment, customer service, and amount of assistance. Most participants commended DOEE for its generous financial assistance and for having a strong customer service ethos, treating participants in a more respectful and dignified manner compared to other human services agencies. One participant described their DOEE experience as follows:

> *You know what? Before this COVID, I used to go to the office, and you sit down with a representative. They collect your stuff. They're processing it right there in front of you. So it was a fast process. And the workers, they were nice, too. I never had any issues or problems with none of the workers. And also, if you want to know about your benefits, or would you qualify, or how much you got, in DC you call the 311, and the operator's able to access that information.*

Participants described learning of programs through online searches, reading bills and materials from other organizations, word of mouth, and referrals from other agencies or community organizations, including churches, especially when facing an energy crisis. The following include how participants described learning about DOEE programs:

> *I first heard about the program when I guess I was living in Columbia Heights apartment building on 14th and Irving. And, like I said, my lights had been out, and they were, at that time, they were located in a red building, down on 14th and U Street, and someone had told me... Actually, my pastor at the church had told me to go down there, and see if they could help me get my lights on and ever since then, I've been with them every year.*
>
> *So, I didn't have a job no more, so I had to apply for unemployment, and then TANF, and then food stamps. And when I went to the office, I was in line. And the security guard asked this lady if she was here to apply for food stamps, and she said, "No, I'm here for the Utility Assistance Program." And that's when I asked around. And they were like, "Yeah, the office is back there," and I did the application. I had my bills that day, because you need to prove DC residency and they helped me out. So, it was a very simple application and it was nice.*

Many respondents remained unclear about DOEE program details and the amount of assistance they qualified for. When probed, few participants were able to distinguish between LIHEAP, UDP, and SFA or were aware of other program offerings such as WAP and CRIAC. The following are examples from participant interviews:

> *So, with the LIHEAP, I guess... it's more explanatory about how it works... Whereas the CRIAC, it wasn't really explanatory on how it is decided benefit wise...CRIAC, the first time I applied, which was during the pandemic, I received a one-time stipend, and I believe a continued discount on it from there on out. This time I only received a discount.*
>
> *...then, the other program, the solar one, I forgot about it, I just thought it just sounded good at the time. I'm not even sure if you get a discount, but I'm assuming that her power comes from solar power. I don't know much about that program.*

In fact, while many participants expressed a desire and need for energy efficiency upgrades, few were successfully enrolled in the Weatherization Assistance Program. For example, one participant shared the following:

> *I heard about that [WAP] through the LIHEAP Program. That's like, when you used to go down, like I said, you used to get appointments every year.*

Were it not for cross-enrollments in LIHEAP, UDP, and SFA, it is likely that few would have known to enlist in these additional programs they otherwise qualify for. (See the recommendations section for more on this topic.)

Furthermore, a lapse in direct follow-up communication left many participants to await their utility bills before knowing the final amount of subsidy applied to their account, since the payments were made directly to the utility companies and participants did not receive a Notice of Award letter.

Moreover, a backlog with the water company to process CRIAC discounts also put households at risk of a water shutoff. The following interview participants indicated this CRIAC issue:

> *Well, no. The water bill ... The problem with the water bill is, what I was explaining earlier is that they will no longer front you the discount. They want the money from DOEE up front. So, today is November. So, your November bill, December bill, and January bill spike until DOEE physically sends them the money.*
>
> *The water company, what they do is every year, they cut you off until they receive money from the government for the [CRIAC] program, where energy and gas companies do not do that… But to have the water company, as they ironically did this month, even with the pandemic, where they have cut the discounts and have charged you an astronomical bill without the discount, stating that they need to receive the money from the Department of Energy before they will proceed with giving you those credits back. So, any money that you have saved over the past year, you're now in a deficit because your bill that used to be $23 dollars a month is now $70 dollars a month.*

Importantly, participants were conservative about applying for services. Many only applied for energy assistance during times of financial hardship as they were concerned about ensuring that services were available for those truly in need of help. Some participants, however, applied for benefits annually, in large measure because they lived on a fixed

income or their household economic circumstances were otherwise stagnant. One participant shared the following about the impact of the pandemic on their income:

> *I would say so because the goal was for me to go back to working, and when the pandemic hit, I was not able to go back out there and find a job. Normally, I used to do paralegal. I could go out to a temp agency and I could get to work. But right now, that has not been the case.*

Impacts of DOEE program participation. Many respondents expressed deep gratitude for the help provided by the programs, noting its invaluable impact on ensuring access to affordable household energy services and preventing shutoffs. One participant shared the following:

> *It definitely is a huge financial weight, and the worry is off for those months. As I said before, not that I was using more, it maybe just cost more for the same use. Maybe that's how they work it out at the electric company. I don't know, but whatever the case... Whatever the reason is, the bill was always higher in the winter months, and it was always a good benefit to have to lessen that cost so that it's more affordable, and manageable, those regular expenses.*

Moreover, the financial assistance also made it possible to meet other basic household needs. Participants described applying the savings from the energy assistance payments and water discounts to other household bills such as rent/mortgage, food, internet, phone bills, and car expenses. One participant expressed how the CRIAC program helped them afford to meet other household needs:

> *Well, as I said before, for the water program, we can speak about, because it's a great help in regards to reducing our expenses. It has allowed us to funnel money from paying the water into other aspects, to help with the increased gas bill in the colder months, and in the warmer months, towards other expenses, for example, for school supplies, things that we need to get.*

Many participants reported greater thermal comfort because they could manage the indoor temperature with a little less concern for costs, as well as less stress and mental strain attributable to more affordable bills. For example, one participated shared:

> *It's definitely all positive. Like I said before, if it wasn't for the program, it'll be a very cold winter and a very hot summer.*

Some reported looking forward to monthly bills that they could now afford rather than dreading arrearages and unmanageable amounts due. This was especially true for CRIAC participants, in part because of how the discount is structured to reduce monthly costs. We found this sentiment across many interviews, with the following as an example:

> *Interviewer: "Now, when you receive your water bill, I guess especially in comparison to what it used to be, now how does that make you feel?"*
>
> *Participant: "I mean, elated, to be quite honest, because sometimes, I look at it, and I'm like, "'Wow. This is really great.'"*

As alluded to above, the discounts and services offered the possibility of respectability and dignity rather than shame and stress.

Experience from participants enrolled in all five programs. Two interview participants are enrolled in all five programs. Both had been participating in LIHEAP for at least 10 years, and LIHEAP was the starting point for their participation in the other DOEE programs (LIHEAP and UDP, followed by WAP, CRIAC, and SFA, in order of enrollment). Both participants receive additional assistance through social security, food assistance, and one receives Section 8 housing assistance. Both participants struggle to make ends meet each month due to living on a fixed income with varying expenses.

> *I'm on a strict income. I get social security, so I have to really just get any type of savings or anything that I can just to make ends meet. That's because sometimes they meet, sometimes they don't.*

As such, both participants are always on the lookout for programs that might help them with their utility and other costs. Both participants expressed gratitude for the assistance they cumulatively receive through the five DOEE programs, and appreciate that each program is tailored to a different need. One participant expressed relief that "for the first time in years, [the water bill] was zero".

However, both noted that first researching, then applying, enrolling, and re-enrolling to each program is burdensome on the participant end, and that not everyone has this capacity. And at the end of the day, this is reason enough for other participants in similar situations (with enough need to enroll in all five programs) to potentially miss out on these programs. Both participants stressed the benefits of streamlining the enrollment and re-enrollment processes across these programs to help participants keep track of their participation.

Preference for benefit delivery. Most program participants expressed a preference for the current delivery method for each program (i.e., annual, monthly), while a few were on the fence since the benefits are the same in the end. The following LIHEAP, UDP, and SFA participant describes this sentiment, stating:

> *I don't know if it makes any difference. I think most people who need this kind of assistance are paid monthly. So then you would think that if they didn't have to worry about their bills, their utility bills every month, that would be great. But if it works out to the same in the end, if they give you $500 for the year and your bill is, and that covers 10 months of your... But on the other hand, maybe it is better to do it monthly because some months there might be an emergency, like you have a sick person and they need air conditioning or they need more electricity, or they need more heat. God knows what. So maybe months would be better. I think that that's a hard one to answer.*
>
> *I prefer the lump sum because I like, me personally, I like to see, for example, my PEPCO bill, right? So I get a bill... And then, I know how much I still have available in my credit, right? And since I have $800, then I know for next month I'm going to have $750. So that, to me, is better and clearer, versus percentage and this and waters cubic, and I don't understand none*

> *of that. It says here that I got a discount on the first 400 cubic feet of water used each month. I don't know what that is [in reference to CRIAC].*

DOEE Staff and Administrator Perspectives

DOEE program staff and administrators conveyed a strong sense of service toward clients and faithful execution of the organization's mission. This was evident in the expressed empathy toward clients and the situational hardships they often face. For example, one DOEE program staff member shared the following:

> *I have a lot of empathy for our clients. I do. When I hear their stories, and I hear stories every day all day of why they're in the situation that they're in, and I'm like, I understand. It's not always something that, oh, you're just a bad parent or you're bad at utility management. Sometimes you're just put in a situation that you don't want to be in. And when I talk to them, I try to remember that time when I felt the way that they feel. You feel helpless, you feel like a failure, you feel as though you're not doing the best that you can do, and who wants to feel like that?*

Such sentiments contributed to a high degree of dedication to program offerings and improving the user experience. Two key examples of such efforts include the swift transition and expansion of online capabilities and other accommodations during the COVID-19 pandemic as well as streamlining enrollment across programs to ease the administrative burdens on clients while meeting program goals. The following is representative of sentiments we saw from DOEE staff across numerous interviews:

> *The most rewarding is just being able to see the change that we are able to effect every single day. Like being in people's homes. And I know because of COVID, we've had to adjust and do more or remote virtual type of interaction. But just ensuring that we have... We are dealing with families and households in the District that are literally, as I'm sure, making the choice between buying food and medicine and school supplies for their kids and just being able to maintain some level of reasonable quality of life. So just knowing that we can provide that relief to households that are most in need.*

Office closures and social distancing measures due to the pandemic precluded meeting clients face to face, including processing applications; therefore, DOEE staff described a concerted effort to ramp up remote services and connect with clients directly to ensure the continuity of benefits. Staff noted the benefits of timelier application processing and the issuance and renewal of benefits. In some cases, clients received approval notices in as little as a day, compared to a much longer processing time for paper-based applications submitted in person or by mail. However, not all participants were able to navigate online systems equally, especially the elderly and those with limited access to or proficiency with online services. One participant shared their perspective on outreach and participation barriers:

> *I think the seniors are underserved. A lot of them just don't know about our program. That's why we try to have that outreach to go to the senior citizen apartment buildings and things. But there are a group of senior citizens and elderly that I think we're not reaching because oftentimes you'll hear in the news of somebody was lighting a stove or something, or somebody didn't have adequate air or couldn't breathe or life support was disconnected, I*

> *mean, oxygen, just a number of things. And I think it's tied to elderly. They just won't reach out. I mean, the information is there. It's in their utility bills. But they just won't. And I think they're underserved. And I think maybe eventually we come up with a plan that, and maybe offer some broader outreach for that demographic.*

Staff described taking additional measures to tend to such clients via outreach by telephone and mail. They also emphasized establishing and/or continuing client relationships to ensure they were supported throughout the application process. Nevertheless, incomplete applications remain an unresolved issue for some clients. While DOEE has dedicated resources to case management services to assist clients in completing the supporting documents, many otherwise eligible clients go without services because they failed to complete the application process.

Another example of streamlining efforts was reliance on a centralized application process to enroll participants in multiple programs, namely LIHEAP, UDP and SFA. Doing so ensured qualified enrollees in the various programs and, importantly, eased the administrative burden for clients and staff alike. The investment in the new software was expected to support cross-enrollment even more and many staff were eager to expand capacity in this way. Program personnel also described forging relationships with other social service agencies such as TANF, SNAP, Medicare, the Department of Aging and Community Living, and nonprofit organizations to assist in their recruitment efforts. By doing so, they successfully identified and enrolled eligible households by meeting potential clients in trusted venues that target a similar client pool.

Points of Convergence and Divergence between Staff, Administration, and Participants

We identified points of convergence and divergence between staff and participant interviews, including program impacts and alternatives to DOEE energy assistance services.

Impacts of support and repeat customers. Participants, program staff, and administrators recognized comfort and economic support and relief as the key impacts of the program, which also contributed to participant stress reduction. While staff and administrators had the impression that participants were "repeat customers" and that self-sufficiency was a primary goal of the benefits rendered, most participants prided themselves on seeking services only when it was absolutely essential. Despite their own eligibility, many described leaving the resource behind for others in greater need and applying only when absolutely necessary. Those that did seek assistance annually did so because their circumstances were unchanged from year to year and they relied on the benefits to make ends meet.

Alternatives to DOEE energy assistance services. Participants and program staff identified other resources that assist with utility bill payments. Both groups agreed that the other options were more limited in terms of the type and amount of assistance to be rendered and in providing customer service. Participants also noted the superior customer service experience at DOEE in comparison to other social service agencies:

> *No one does it on the scale that we do, but there are other resources that are for utility assistance. The Salvation Army has been great at utility and rental assistance. So usually, if*

> *they use up their benefit for us for the year, if they call and I check and I see that you've already received your benefit this year, so we can't help, I'll usually send them to somewhere else. And the Salvation Army is my first go-to because they usually have funding, and they have a good turnaround rate for getting your utilities and rent paid. Another resource is our councilmen. So your ward councilmen and councilwomen, they have the ability to pay. And each one is different. For the most part, they will pay up to $200 to $300 to help with your utilities. But it has to be within ... It can't be an outrageous bill. Like if you have a $2,000 bill, they are not, because they only have a limited amount of funds. So, they want to make sure, if I give you $200, it's going to be enough to get your electric cut back on or your water and so forth. So, your local council members, they are a big help.* (DOEE staff)

While program staff and administrators emphasized the connection to larger environmental goals related to sustainability and the reduction of greenhouse gas emissions via renewable energy technologies, most clients were not aware of how their participation in the energy assistance programs positively contributed to environmental stewardship. The following are examples:

> *But I think it's good that we do try to give people access to this new ... give them the opportunity to participate in helping the environment, in the District. That's probably the biggest argument for our program, like I said, we really could just turn over the money and keep going. And there's certainly an argument for that, but allowing them to participate in what the District's doing around solar and making the environment cleaner and making that participation accessible to everyone, I think does have some community benefit, people feel like they're helping the district. Usually when we say, "You're helping the District by doing this," that is a selling point for folks, they gravitate to.* (DOEE staff)

> *Aside from the solar for the community, I don't know for sure if I would say that I was attracted to the program because of the environmental, because it was more of an affordability issue. I don't know in their literature or in the program itself it specifically states applying to this program means you're going to be environmentally sound.* (DOEE participant)

This difference is explained by a) clients' inadequate understanding of the Solar For All program components and b) limited enrollment in weatherization services. One participant also expressed that their perception was that environmental programs were utilized by residents of whiter, wealthier neighborhoods in the District. This indicates that there may be a need for additional outreach to participants in ways that they feel represented, heard, and understood before they apply to DOEE's programs.

> *If you go to Northwest, or you go to the other side of Southeast, you know where the uppity people are, they're participating [in DOEE's programs]. They're getting the programs, and these are people that can afford it.*

Participants cited recycling and conserving energy and water resources as examples of how they prioritized environmentalism. Many participants were curious about other forms of environmental stewardship and expressed interest in learning more via educational tools and strategies tied to DOEE programs. Some of the longer-term participants suggested reintroducing the weatherization kits distributed years ago as an example of a do-it-yourself

approach to conserving energy and mitigating drafts in the home. One participant highlighted this:

> *After your appointment, after you apply and everything, the first time, well, years ago, they would give you a little bag, and it had a lot of energy savings things. Like, the light bulbs, the weather stripping and caulking, and all that kind of good stuff.* (DOEE participant)

Participants described reluctance on the part of landlords to participate in DOEE programs, thereby limiting their ability to participate fully in the agency's offerings. DOEE staff identified gaps in providing service to renters and those living in multiunit housing, such as the following:

> *Yeah. So I would say the gaps in terms of those that we can assist, a lot of people will reach out to us from multifamily homes, and we're not able to assist anyone in multifamily homes, and that's kind of an area where I think DC Water is also interested in figuring out next steps because just logistically, the way that we run it right now, we would not be able to do that, but maybe on DC Water's end, they would be able to help multifamily homes. So, I think that's definitely a big gap in the program and something that hopefully we can address in the next fiscal year.* (DOEE staff)

Policy Recommendations

The following policy recommendations identify barriers and opportunities to increase the effectiveness of DOEE affordability programs. These recommendations also aim to reduce high energy and water burdens to improve utility affordability, home health and comfort, and overall economic prosperity of District residents. Our recommendations include the following.

Program Awareness and Accessibility Recommendations

- Increase targeted direct program outreach and re-enrollment efforts
- Align water and energy affordability support and outreach
- Employ diverse methods for program outreach and continued communication
- Provide follow-up confirmation on benefits and services
- Connect energy saving and clean energy messaging with environmental benefits

Program Targeting Recommendations

- Target resources towards households with disproportionately high utility burdens
- Target resources to households experiencing disproportionate health burdens
- Provide resources for affordable housing building owners to help keep rents affordable
- Develop and include additional equity-related goals to measure program success
- Consider tiered benefits to support moderate-income household needs

Program Design and Delivery Recommendations

- Continue building robust stakeholder and community engagement practices

- Increase structural solutions, such as weatherization and solar energy
- Create a one-stop-shop model for program enrollment
- Maintain emergency water assistance and create a leak reduction program
- Validate and educate on energy conservation strategies

These recommendations rely heavily on the qualitative analysis findings, while also reflecting findings from the literature review and quantitative utility burden analysis. The recommendations consider how the energy assistance programs currently interact with one another, and how they could better support each other's goals and outcomes.

PROGRAM AWARENESS AND ACCESSIBILITY RECOMMENDATIONS

We heard from program participants that they did not always have a clear grasp of the assistance programs available and the program objectives, and that many experienced barriers to program awareness and accessibility. The following recommendations focus on how DOEE can improve communication and program access for potential or current program participants by improving program messaging, streamlining program enrollment, and fostering trust.

Increase targeted direct program outreach and re-enrollment efforts. Program participants experience barriers to navigating the system and accessing utility assistance programs. DOEE can design enrollment campaigns to both identify newly income-eligible households and reach out to past program participants. Using multiple channels for enrollment, such as mail and email, proves especially important during COVID, when access to in-person enrollment centers is not available or extremely limited. One participant expressed barriers to enrolling and accessing programs:

> *I'm just so sorry for the person that may not have that understanding or knowledge as to how to navigate the system, because the system is not easy to navigate... [such as] people that maybe have mental challenges or struggle with computer knowledge or understanding the process, if they're elderly or in need of help.* (SFA, WAP, and LIHEAP participant)

DOEE can continue to provide direct and targeted outreach for their programs as well as online pathways to enroll. Many program participants appreciated the opportunity to complete applications online and found email reminders helpful. Some interview participants who had participated in LIHEAP in the past indicated that, at the time of their interview in September or October 2020, they had not yet received information about enrollment for the year. From the interviews, we found that the most cross-enrolled participants were also the most willing and able to do research themselves into available programs, which does not represent the majority of participants interviewed. This means that any households facing barriers to conducting research or finding assistance resources may benefit from additional outreach efforts from DOEE.

In addition, program participants showed a preference and appreciation for automatic enrollment. DOEE can also consider strategies to automatically enroll households who are participating in other income-qualified programs, such as SNAP or TANF, into bill assistance and SFA programs. The following two participants expressed their preference for automatic enrollment:

> *It's not cool at all that you have to subject yourself to [re-enrollment]. You got it last year. Obviously, you'll get it this year… Why do you keep doing things when you know that it's the same old, same old, same old? It doesn't make sense.* (Participant of all five programs)

> *I think that will be ideal. Absolutely, because as I said before, not everybody has the time, or then they're tired... A lot of people, they don't know, or they don't know how to find the resources. So, if you qualify, I think that will be the best thing to do to qualify, you should be automatically enrolled.* (Participant of SFA and CRIAC)

Furthermore, providing participants with a *receipt of benefits*, with all benefits listed in one format/notice (e.g., online and/or by mail), might help participants better understand their benefits. One participant suggested that LIHEAP participants could be grandfathered in to other DOEE programs that they qualify for, instead of having participants submit all their documentation again. She also mentioned that the "neighborhood blitz" tactic of sending representatives out to communities to explain these programs in person (when it is safe to do so) would help outreach. Ideally, she suggested, these messengers would match the demographics of the neighborhood itself.

Align water and energy affordability support and outreach. Based on the utility burden analysis, households experiencing the highest water burdens are also experiencing high utility burdens. Even if participants are enrolled in one of DOEE's utility affordability programs, they are sometimes unaware of the availability of other programs that they might qualify for and benefit from. Aligning outreach for energy and water programs can help provide the most robust and comprehensive solutions for highly energy- and water-burdened households in the District. One participant expressed concerns and anxiety around income qualification for programs:

> *Well, it's a little bit scary how much money you're making… Look, I know that they have to have some kind of number [for income qualification], but maybe they could just take it off a tax form to see what your income was last year… you should just automatically qualify without having to prove every little nickel and penny. My kid made $250 at his local job. Is that going to throw me off? We did qualify, but it's just like it becomes one more headache.* (Participant of LIHEAP, UDP, and CRIAC)

Moving towards a joint-application process and/or system that streamlines enrollment across all five affordability programs—especially focused on cross enrollment between and energy and water affordability programs—can help households receive all available benefits. Furthermore, streamlining enrollment processes should happen during initial outreach campaigns as well as during intake processes. Program participants indicated that verifying income can prove an onerous process. Combining discounts and benefits across these five energy and water affordability programs can lower enrollment barriers by streamlining income qualification.

In addition, participants indicated that it was unclear how to balance assistance from both energy and water utilities through payment plans and budget billing in addition to support from DOEE. DOEE can work with the energy and water utilities to clarify and align outreach messaging and support, especially as many more households may move to payment plans due to the impact of COVID. DOEE can then improve communication about

program enrollment and cross enrollment across DOEE and utility programs, such as payment plans, to help participants better understand the interaction and scope of available utility affordability programs.

Employ diverse methods for program outreach and continued communication. DOEE should continue to employ diverse methods of communications to meet the needs of residents. Program participants indicated that email is an effective form of communication, as phone calls and text messages can be difficult to respond to during work hours and can be harder to verify. This indicates that it is important to make messaging clear and show that it is obviously from a legitimate source (i.e., DOEE). One participant shared positive feedback on DOEE using multiple forms of communication:

> *I think they're doing a great job because receiving email has been really good. Because sometimes when I receive text messages, or phone calls, I'm not sure who's calling me. But when it comes to emails, you guys are doing a great job. If y'all want to call me and leave voicemails that's even better. Because seven o'clock in the morning, I'm at work. I'm not even able to pick up the phone so if y'all leaving me a voicemail, that helps too. But I think all together with the communication and reaching out to me about the program is great.* (Participant of LIHEAP)

Based on feedback from participant interviews, email proves to be an effective outreach strategy for past participants who provided email addresses during enrollment; for participants without an email address, additional phone follow-up or additional mailers may be helpful to ensure equitable outreach and enrollment while in-person enrollment centers remain closed. We acknowledge that we recruited most interview participants through email recruitment for this study, indicating that these residents may be more likely to prefer email communication.[19] DOEE should continue to employ multiple forms of outreach and communication (i.e., mail, email, phone calls, text messages) to ensure that effective communication reaches residents. Returning to in-person communication and support, when safe to do so, is also especially helpful for residents who may lack computer literacy or may need additional help to understand the enrollment process and requirements. Interview participants also indicated the importance of outreach staff who look like and represent the community. For example, one participant shared the following:

> *I think it's the messengers that bring the program to the area, because let's face it, if you have a predominantly Hispanic area, then you send a Hispanic person in there. If you have a predominantly African American area, you send one of them in there. The turnoff is when you send people that don't [resemble the community].* (Participant in all five programs)

Provide follow-up confirmation of benefits and services. Unlike the CRIAC program, LIHEAP, UDP, and SFA do not have systems in place to inform participants how much and when benefits will be applied to their utility bills. Participants were often left uncertain of

[19] We also conducted email recruitment before postcard recruitment, which meant we had fewer interview spots available for those recruited through the postcards. This may have hindered the number of participants who signed up through postcard recruitment.

the status of their applications and awarded benefits. Participants appreciated the clarity they received from CRIAC about their benefits.

Many participants also often felt a lack of clarity around where one program ended and another began, as well as which District offices or departments were relevant for them to seek and receive help. DOEE can confirm benefits for LIHEAP, UDP, and SFA, and can work to increase clarity around the confirmation of benefits and who is providing them.

DOEE can also work to improve follow-up communication with WAP participants and contractors to ensure all promised measures are installed successfully and participants are satisfied with the program. One WAP participant expressed disappointment that they never received the refrigerator they were promised and were unable to connect with the right person to resolve the issue. They shared the following:

> *[WAP] was disappointing. They came in and did really good work, but then… there was no follow-up. I'm supposed to get a refrigerator and it never came. And then I called multiple times and I was told that it was the responsibility of the contractor… Everybody dropped the ball and I still never got a refrigerator, even though my refrigerator is old and it's not working 100%.* (Participant of WAP, SFA, LIHEAP, and UDP)

Other interviewees indicated that this type of situation was not uncommon. To avoid potential miscommunication, DOEE can work to improve clarity of communication about eligible and approved measures. DOEE can work with the WAP implementation contractors to improve communication with participants about measures they will receive through the program. This will help avoid disappointment, build trust, and improve clarity of program outcomes for participants.

Connect energy saving and clean energy messaging with environmental benefits. Many interviewees indicated that while they are concerned about the environment, they did not see their participation in DOEE's programs as an environmentally conscious act. One participant shared the following:

> *I'm not too aware of [environmental issues], so maybe if I can get more information [about climate change and how it connects to DOEE's affordability programs], I can understand it and make it as clear as possible.* (Participant of SFA and LIHEAP/UDP)

Although financial support was the largest driver for DOEE's five programs, many interviewees indicated that they do take actions to benefit the environment and that they generally valued environmental stewardship. DOEE has a clear opportunity to change the narrative around how its programs benefit both affordability and the environment and can do so by highlighting the environmental connection for program participants in more visible or concrete ways, such as through stories, visuals and graphics, messaging on advertising materials, and/or community workshops.

PROGRAM TARGETING RECOMMENDATIONS

We identified the need for utility assistance across a broad range of low- and moderate-income households. Programs addressing utility affordability must work to balance this breadth of need with a focus on historically and presently disadvantaged and highly

burdened communities. DOEE can work to better target households to participate in utility affordability programs.

Target resources towards households with disproportionately high utility burdens. DOEE can target energy and water affordability program outreach towards households with disproportionately high energy and water burdens. This includes households with a family member with a disability, older adults (over 65), Black and Hispanic households, renters, households receiving food stamps, and households without a high school degree. DOEE can build on current efforts to create outreach campaigns that cross enroll households in energy and water affordability programs based on their income qualification and support needs.

DOEE staff has also identified older adults, residents who speak Spanish, and moderate-income households as harder to reach and potentially underserved by affordability programs. DOEE can target outreach campaigns and efforts to reach these overburdened subgroups in order to direct resources towards those who may have disproportionately high burdens and need for support.

Target resources to households experiencing disproportionate health burdens. In addition to targeting groups with high utility burdens, DOEE can also focus resources on communities in the District with disproportionate health impacts. Housing quality has a direct effect on human health. Indoor air quality, allergens, cold drafts, excessive heat, and pests can all exacerbate a number of health problems including asthma and other respiratory diseases, chronic obstructive pulmonary disorder (COPD), cancer, and cognitive function. Some energy efficiency and weatherization programs aim to mitigate these indoor health risks while also saving energy.[20] Many interviewees indicated that poor housing quality negatively affected their health and energy use. One participant shared the following:

> *I had problems with the heat throughout the time that I was there. Roaches, bugs, mice. I had to complain the whole time because I didn't have heat going on at times.* (Participant of LIHEAP, UDP, and SFA)

Through our literature review, we identified that neighborhoods located in the Northwest (i.e., Wards 1–6) had a higher health index (i.e., opportunity for good health) than neighborhoods in the Southeast (i.e., Wards 7 and 8). This difference is influenced by social determinants of health such as race, education, housing, income, and social environment. More recently, COVID-19 has had the greatest impact on health outcomes in Wards 7 and 8. Therefore, targeting utility affordability resources to communities with lower health indexes—especially energy efficiency and weatherization programs—can help address some of the impacts of the home environment on resident health. In addition, DOEE could partner to link asthma education materials with energy efficiency, weatherization, and other utility

[20] See 2018 ACEE report, *The Next Nexus: Exemplary Programs That Save Energy and Improve Health*: www.aceee.org/research-report/h1802.

affordability program materials to cross-promote programs that will benefit residents' health and well-being.

Provide resources for affordable housing building owners to help keep rents affordable. Our utility burden assessments were unable to include households who do not pay their energy and water bills directly (i.e., households whose utility costs are included in their rent). Similarly, DOEE's energy and water assistance programs are only provided to households who pay their utility bills directly. Building owners who pay for utilities directly will often pass on increased energy and water costs to residents through permanent rent increases. Bill assistance misses households who face rising utility costs indirectly through rent increases.

DC Water recently launched an effort to reach this population. In February 2021, DC Water's board approved a new multifamily emergency relief program to provide assistance to households who pay for water bills through their rent (DC Water 2021a). The Multifamily Assistance Program (MAP) aims to serve affordable housing and buildings with tenants whose income is less than or equal to 80% AMI, and requires that participating landlords provide 90% of the credit they receive back to the tenants through reduced rent. DC Water estimates 10,000 potential multifamily buildings (180,000 units) could be eligible and plans to dedicate $2.4 to $4 million of its cash surplus to the program, running through the end of FY2021 (Fenston 2021).

DOEE can continue to make targeted efforts to reach multifamily and affordable housing building owners with energy and water affordability programs, and especially to provide low-income renters with weatherization, renewable energy services, and leak support to help ensure that rents remain affordable. To ensure that the DC Water MAP multifamily emergency relief program is successful, DOEE can also support outreach and enrollment, as well as support accountability to ensure that landlords return the program benefit to the tenants.

Develop and include additional equity-related goals to measure program success. DOEE can work to develop and include additional equity-related outcomes and goals to measure the success of its energy affordability programs. LIHEAP, SFA, and CRIAC currently have goals around achieving a level of utility affordability. For example, DOEE has a goal to reduce energy burdens to 3% for households participating in LIHEAP, SFA has a goal to reduce electric bills by 50% for participating households, and CRIAC calculates benefits based on estimated water burden reduction across income thresholds. In addition to these affordability goals, DOEE can create additional targets such as using participant demographic data to set participation goals across location (e.g., by ward or census tract) and across factors such as race, ethnicity, and/or age. By setting these additional goals, DOEE may be better able to track how well programs are reaching those most in need of assistance, as well as ensuring that assistance and program enrollment is equitably distributed.

The District government can also consider incorporating affordability goals and strategies into wider clean energy and equity planning efforts. The District's DC Clean Energy Plan, Sustainable DC 2.0 Plan, and Climate Ready DC Plan do not include specific goals that aim to address utility affordability across the District at large. By incorporating utility

affordability goals and strategies, such as lowering low-income energy burdens to 3%, into city-wide plans, DOEE and other city departments can continue to consider how DOEE's programs fit into broader strategies to bring equitable health, environmental, and economic benefits to residents and communities.

Consider tiered benefits to support moderate-income household needs. The qualitative analysis found that many households with more moderate income (e.g., SFA at 80% AMI and CRIAC at 100% AMI) experienced energy and water affordability as a major issue. These families often have additional financial obligations (e.g., medical costs, childcare costs), yet less access to sources of support. We recommend tiered approaches (e.g., CRIAC model) to provide moderate-income households with access to much-needed assistance. For programs where assistance funds are not capped, tiered support can allow for individuals to qualify who may have limited disposable income due to expenses and circumstances. One person expressed this as follows:

> *I'm a low-middle-class person, so right now, I'm very grateful that I still qualify for this CRIAC program, because the more you make in this country, the more screwed up you are, but they don't really look into family circumstances. They don't really see the difference between a single parent versus a family where there are two working adults. These are things that they don't really don't look into, since when you have bigger responsibilities that you need to make more money, because you have to, not because you want to.* (Participant of SFA and CRIAC)

Tiered benefits allow for the lowest income households to receive the most assistance while still providing support for households with limited disposable income and high utility burdens, who can greatly benefit from additional energy assistance and clean energy investment. Based on the qualitative analysis, we see CRIAC as a model program in terms of the deep discount, support for higher income participants, and continued communication about program benefits.

DOEE also has the opportunity to provide utility support to a higher income tier through the U.S. Department of Treasury (USDT) Emergency Rental Assistance Program, which will make $25 billion available to assist households who are unable to pay rent and utilities due to the COVID-19 pandemic. DOEE can coordinate with the Department of Homeless Services and the Department of Housing and Community Development on the implementation of this program to provide utility relief to residents experiencing housing insecurity. To be launched in 2021, this program will provide support to pay rent and utilities to households at 80% AMI, which is higher than the 60% SMI limits for most of the utility assistance programs (e.g., LIHEAP, RAD, RES) (Department of the Treasury 2021).

PROGRAM DESIGN AND DELIVERY RECOMMENDATIONS

DOEE can improve program design and delivery to address barriers to achieving longer-term affordability outcomes for participants. Designing programs through robust stakeholder engagement, expanding structural solutions, creating a one-stop-shop enrollment model, maintaining and expanding water assistance, and providing energy conservation education are strategies that can align programs with resident needs and benefits in the long term.

Continue building robust stakeholder and community engagement practices. DOEE can build on the current efforts of its Equity Task Force and its new Racial Equity Impact Assessment Tool to expand an equitable and robust stakeholder and community engagement process. The *Spectrum of Community Engagement to Ownership* provides a model to visualize types of community engagement (González and Movement Strategy 2019). Engagement models that involve collaboration can lead to more equitable outcomes.

DOEE can work to identify community-based organizations that provide services and support to overburdened communities, residents, and other key stakeholders to engage in collaborative planning. Collaborative stakeholder engagement processes should set goals and also include accountability structures and ways to evaluate and measure progress towards goals. Community engagement should be transparent, acknowledge past harms, resourced, build trust over time, provide compensation for participation, and set a commitment to communication and follow-through.[21]

Increase structural solutions for utility affordability, such as weatherization and solar energy. Weatherization and renewable energy investments provide structural solutions to achieving long-term utility affordability.[22] Through the interviews, many households indicated the need for more resources to address thermal comfort, inefficiencies, poor insulation, aged appliances, and other home factors that can be addressed through weatherization. Household interviews indicated a great need for weatherization and energy efficiency measures. In 2019, the District weatherized only 360 households through WAP, and only 297 households in 2020. The scale of this program does not currently meet the need in the District. DOEE can explore new funding sources to leverage funds to support weatherization, such as from ratepayer, local, or health-related funding sources. For example, DOEE could coordinate and leverage ratepayer funds through PEPCO and Washington Gas's new low-income energy efficiency programs to support WAP and other weatherization efforts. DOEE can also continue to tie weatherization with health and safety measures, such as the lead hazard control program, to ensure both energy and health benefits for program participants.

DOEE can continue to partner with DCSEU and the energy utilities to cross-promote and enroll program participants in energy-saving programs. As new energy efficiency programs are implemented through ratepayer funds, DOEE can continue coordinating eligible households across available programs. DOEE can also consider leveraging additional funding opportunities, such as new federal funding sources for COVID recovery or additional District funding, for energy efficiency and weatherization. Increased investment in long-term solutions such as energy efficiency, weatherization, and solar energy can help improve utility affordability and the property of residents in the long term.

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[21] See the Greenlink Equity Map *Process Guide for City-Community Partnerships* for a framework for collaborative community engagement around data collection and analysis. See the Urban Sustainability Director's Network *Guidebook on Equitable Clean Energy Program Design for Local Governments and Partners* for a framework for designing equitable clean-energy programs with community support.

[22] See ACEEE research on energy burdens for more information. ACEEE finds that weatherization can reduce high energy burdens for low-income households by 25% on average.

Create a one-stop-shop model for program enrollment. A one-stop-shop model can provide coordination across electricity, gas, and water and DCSEU programs and resources, as well as help address program barriers.[23] Households with high water burdens typically also have high utility burdens. Solutions that address both water and energy affordability are important to ensure overall bill affordability as well as home health and comfort. DOEE can act as a central location to coordinate energy assistance resources for residents while providing information on DOEE, utility, and other available support. Appendix A includes a summary of available utility assistance programs in the District; DOEE can coordinate resources across these programs.

We learned from the program staff interviews that DOEE staff do have strategies to cross enroll households. DOEE can continue to streamline this process across intake and enrollment centers and strategies to create a more centralized single point of contact, develop a standard universal intake application and income verification process across programs, and provide streamlined support for potential applicants to identify available programs for enrollment. This can help lower barriers to entry for program participants by requiring only one application, as well as helping inform residents of all available programs.

Maintain emergency water assistance and create a leak reduction program. We recommend that DOEE maintain the emergency water bill assistance program after the Mayor's Public Health Emergency ends. Interviewees indicated a need for emergency water assistance through our interviews, highlighting that this was a programmatic gap before this additional assistance was added in 2020. One participant expressed their experience before DOEE had emergency water assistance available:

> *I went to Salvation Army for my water because DOEE does not give you emergency assistance for water. They do that for gas and electric and oil, but not for your water bill.* (Participant in all five programs)

DOEE can also leverage the new federal LIHWAP to provide support to households with water bill arrears through DC Water. In addition, District residents could benefit from a leak reduction program that runs independently and/or is paired with CRIAC. Water leaks can often lead to extremely high and unaffordable water bills; pairing a leak reduction program that provides immediate assistance with leak repair and additional water efficiency and bill discounts will help greatly reduce water cost burdens in the long term.

Validate and educate on energy and water conservation strategies. Most participants shared a number of conservation strategies that reduce their carbon footprint and overall energy and water use, yet they seemed unaware of the positive impact of their practices on the environment. DOEE can explore messaging that can help to validate, support, and encourage energy- and water-saving strategies and behaviors by linking these actions to additional environmental, health, and financial benefits. Education campaigns that touch on

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[23] See the 2020 report by Innovate (funded by the European Union), *How to Set up a One-Stop-Shop for Integrated Home Energy Renovation, A step-by-step guide for local authorities and other actors*, for ideas on how to set up a one-stop-shop coordination model. energy-cities.eu/wp-content/uploads/2020/07/INNOVATE_guide_FINAL.pdf.

a number of benefits from energy- and water-saving actions will help District residents learn how to conserve energy and water and connect these actions to not only lower bills but also to other positive outcomes for the community. Participants also indicated that they liked the Do-It-Yourself (DIY) goody bags that DOEE provided in the past, and supported the relaunch of this or similar energy education efforts in the future. Once they reopen, DCSEU could set up a table at the Energy Centers to provide their energy kits to residents as they apply for energy assistance programs. This would help DCSEU distribute resources while also providing a positive experience and interaction with residents.

Conclusion

This report finds that even before the pandemic, many District residents experienced systemic inequality and high utility burdens that led them to much-needed assistance. Low-income households in the District are especially overburdened by utility bills as compared to households nationally; households with disproportionate burdens also include households with a family member with a disability, older adults (over 65), Black and Hispanic households, renters, households receiving food stamps, and households with less than a high school education.

DOEE's utility affordability programs reduce the District's environmental impact while improving affordability and comfort for low- and moderate-income District residents. While DOEE's utility affordability programs provide much needed support for many, resident interviews provided us with insight into how DOEE can continue to improve the reach, effectiveness, and outcomes of these programs through changes to program outreach, targeting, design, and delivery. As the pandemic continues to affect the lowest income residents, we hope that the recommendations from this report will increase equitable access to and utilization of solar installations, energy efficiency, and weatherization investments.

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Appendix A. District Utility Affordability Programs

Table A1. Utility assistance programs offered to DC residents through DOEE, DC Water, DCSEU, and local nonprofits

Program	Program implementer	Income qualification limit	Description
Utility bill discounts			
Low Income Home Energy Assistance Program (LIHEAP)	DOEE	60% SMI	Income-eligible households can receive a one-time, regular energy-bill assistance between $250 and $1,800. Bill assistance is determined based on household size, total household income, heating source, and dwelling type.
Utility Discount Program (UDP)	DOEE	60% SMI	The program offers a discount to low-income District residents to reduce their utility costs. Eligible residents can receive up to $475 per year on their electric bills, up to $276 during the winter season on their gas bills, or over $400 annually on their water and sewer bills.
Clean River Impervious Area Change (CRIAC) Residential Relief Program	DOEE	100% AMI	Income-eligible residents receive a monthly discount on their single-family and individually metered DC Water bills. The program offers three tiers of assistance ($75, $50, and $15 per month), which are determined by household size and income. DC Water ratepayers fund the two lower tiers of the program, and the District government funds the third tier. During the coronavirus pandemic, Mayor Muriel Bowser, the Council for the District of Columbia, and the District government authorized a one-time emergency benefit up to $2,000 to help residents struggling with unpaid DC water bills. In addition, eligible households will receive one bill discount from one of the CAP tiers available through the CRIAC program.
Multifamily Assistance Program (MAP)	DC Water	60% SMI	HOA representatives of eligible multifamily properties can apply for water bill support. For each unit where a qualifying tenant resides, DC Water will post a credit to the property's water service account. The participating HOA or owner will then post 90% of the credit to the qualifying occupant's rental or HOA account. The intended purpose is to reduce the amount due in rent or HOA fees by the amount due for the tenant's share of the water bill.
Residential Aid Discount Program (RAD)	PEPCO	60% SMI	Income-eligible DC residents receive a monthly credit for their distribution charges. RAD customers will receive a discount of about 25% on their overall bill, which covers the distribution charge, the Residential Aid Discount surcharge, and the residential aid credit surcharges.
Residential Essential Service (RES)	Washington Gas	60% SMI	Income-eligible Washington Gas customers receive a 25% discount on their bill. This discount covers both customer and distribution charges. If the price of natural gas per therm rises above 50% of the base year for a given month, customers will automatically receive an increase to the discount of up to 70%.
Washington Gas Budget Plan	Washington Gas	No limit	The Budget Plan is a 12-month program designed to spread the cost of winter heating over the entire year for customers. Each month, customers will receive their gas usage and bill amounts along with budget installments. Customers must ensure that they make their monthly budget payment or they may be removed from the plan and will be required to pay the full amount of the balance.

Program	Program implementer	Income qualification limit	Description
Washington Area Fuel Fund (WAFF)	Salvation Army	60% SMI	This program assists customers who do not qualify for or have exhausted government-funded energy assistance. WAFF offers funds for all types of fuel services during the winter heating season. The program is funded by Washington Gas and private donations.
Serving People by Lending a Supporting Hand (SPLASH)	Greater Washington Urban League (GWUL)	60% SMI	In partnership with DC Water and Sewer Authority, GWUL offers one-time emergency assistance to DC Water customers experiencing a financial emergency. The program is funded by DC water employees, customers, and community members. Eligible residents can apply for assistance once per year and receive up to $350.
PEPCO Energy Assistance	GWUL	60% SMI	In partnership with PEPCO, GWUL provides assistance to families needing assistance with their electric and gas bills. Once per year, eligible families can apply for up to $500 to help pay for their utilities.
Energy-saving programs			
Solar for All	DOEE	80% AMI	Income-eligible DC homeowners can qualify for a free installation of solar photovoltaic systems in their homes or a subscription to a community renewable energy facility, regardless of whether they live in a single-family home with a roof to install solar or not. Participants of the program are expected to save approximately $500 annually. The Renewable Energy Development Fund funds the program.
DCSEU rebates and energy efficiency kits	DCSEU	No limit	DC residents can receive rebates for purchasing ENERGY STAR appliances, HVAC equipment, lighting, and smart thermostats. DCSEU also offers energy efficiency kits to income-qualified households.
Home upgrades, repairs, and weatherization			
Weatherization Assistance Program (WAP)	DOEE	60% SMI	WAP is a federally funded program from the U.S. Department of Energy. DOEE also elects to set aside up to 15% of the LIHEAP grant for weatherization, funded by the U.S. Department of Health and Human Service. In the District, this program is administered through selected community-based organizations and non-profits. WAP provides participants with energy audits and installs energy efficiency measures like insulation, duct sealing, heating and cooling systems repair or replacement, air infiltration mitigation, and installing ENERGY STAR lighting and appliances to reduce energy bills by making homes more energy efficient.
Emergency HVAC	DOEE	60% SMI	The program assists income-eligible District residents with the repair or replacement of hot-water tanks, and heating systems for single-family homes. If funding remains after the heating season, the program provides for the repair or replacement of air-conditioning systems.
Senior StayCool	DOEE and the Department of Aging and Community Living (DACL)	60% SMI	This is a one-time COVID program that DOEE offered in partnership with DACL to income-eligible District residents over 60 years old for the repair or replacement of window air-conditioning units for single-family homes.

Program	Program implementer	Income qualification limit	Description
Lead-Based Paint Hazard Control Program (LHC)	DOEE	80% AMI	The program provides funding to eligible single-family and multifamily properties to reduce or eliminate lead-based paint hazards. Households can receive up to $11,000 per unit for lead-based-paint-related repairs. The program is funded by the U.S. Department of Housing and Urban Development.
Lead Pipe Replacement Assistance Program (LPRAP)	DOEE	No limit	DC homeowners can receive up to a 50% discount (up to $2,500) to replace lead pipes connected to the city water supply. While there are no income restrictions to apply, homeowners with income at or below the program limits can receive a free replacement or an 80% discount.

Appendix B. Energy and Water Burden Methodology

This analysis follows ACEEE's methodology, used in its three energy burden reports (Drehobl, Ross, and Ayala 2020; Ross, Drehobl and Stickles 2017; Drehobl and Ross 2016). For this study, we analyzed the American Housing Survey (AHS) 2019 data (released in October 2020), which is issued by the U.S. Department of Housing and Urban Development (HUD). The AHS is a biennial household-level survey by the Census Bureau that collects a variety of housing and demographic data from national and regional cross-sections of households across the United States, as well as in a subset of metropolitan statistical areas (MSAs). The Washington, DC metropolitan statistical area (MSA) is included in the 2019 AHS dataset. The AHS includes household income data and energy and water cost data that we use as the basis of our energy, water, and combined burden calculations. The AHS models its energy cost data based on household characteristics ascertained through its survey and also uses data collected through the Residential Energy Consumption Survey (RECS) for a different national set of households.[24] We analyzed the weighted sample data for our calculations.

For the utility burden analysis, we calculated energy burdens using the total annual cost of electricity, natural gas, and other heating fuels and total annual household income. We calculated median energy burdens and the percentage of households with high and severe energy burdens across a variety of demographic groups and household building characteristics for individuals in the Washington, DC MSA. We define households with high energy burdens as those spending more than 6% of their income on electricity and heating fuel costs, and households with severe energy burdens as those spending more than 10% of their income on energy costs.[25] These two categories are not mutually exclusive, as households with severe energy burdens are a subset of those with high energy burdens. We compare the energy burden findings to ACEEE's 2020 national energy burden findings (Drehobl, Ross, and Ayala 2020).

We also calculated median water burdens for households in the Washington, DC MSA across a variety of demographic groups and household building characteristics as well as the percentage of households with a high water burden of more than 4%. For households with both water and energy data available, we also calculated a combined energy and water burden, as well as the percentage with a high combined utility burden of above 10%. We

[24] Beginning with the 2015 edition, the AHS stopped including questions on energy costs. Previously, most of those data were self-reported. As part of the 2015 AHS redesign, researchers began estimating energy costs through regression-model imputation. They created the utility estimation system (UES) to estimate annual energy costs using regression models developed from the RECS, which collects administrative data from suppliers on actual billing amounts. This estimate was used to calculate average monthly energy costs. The RECS also collects some housing characteristics similar to those the AHS collects, which allows the construction of models that can then be applied to the AHS. For more on the energy cost estimation model development and decisions for the 2015 AHS, see www.huduser.gov/portal/sites/default/files/pdf/American-Housing-Survey.pdf.

[25] HUD determines affordable housing costs to be 30% of total household income. Researchers have determined that, typically, 20% of total housing expenses are energy costs. This equates to 6% of total income spent on energy bills as an affordable level (Fisher Sheehan & Colton 2020). We consider energy burdens above 6% to be high burdens, with burdens above 10% to be severe. This method is in line with other research (APPRISE 2005).

also calculated energy, water, and combined burdens for the national sample in the 2019 AHS dataset to compare to the DC metro area.

We analyzed energy, water, and combined burdens for the Washington, DC metro area across a variety of factors including race and ethnicity, age, education and ability, building tenure and age, and building type and heating fuel. We chose the income thresholds to match those of DOEE's utility affordability program income thresholds.

Figure B1 includes the demographic and housing-related factors included in the analysis.

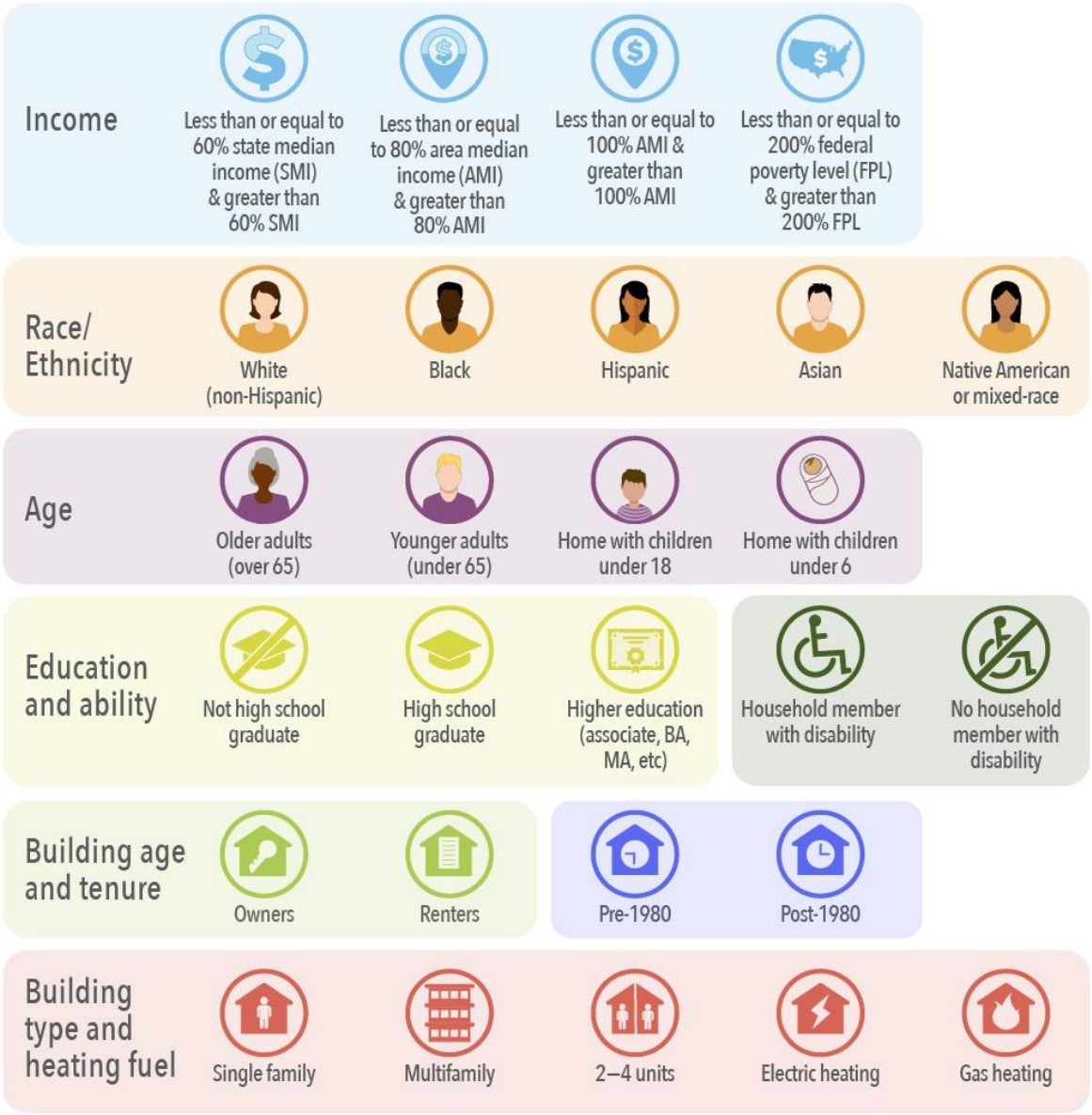

Figure AB1. Demographic and housing factors analyzed across the energy, water, and combined utility burden analyses, including income, race/ethnicity, age, education and ability, building tenure and age, and building type and heating fuel. *Source:* AHS 2019 data.

Limitations

AHS includes modeled energy costs, which are determined by matching characteristics of households in the AHS to characteristics of households in the RECS. This means that the annual energy bills may differ from actual bills.

We also exclude households from the burden analyses that do not report income and do not pay for their electricity, water, and main heating fuel. Thus, our report findings do not include data on renters who pay for their electricity, water, or heat in their rent, or households with no annual income reported. Our exclusion criteria for each analysis includes the following:

- *Energy burden analysis* excludes households who do not report positive income, do not pay for their electricity, and/or do not pay for their main heating fuel.
- *Water burden analysis* excludes households who do not report positive income and/or do not pay for their water costs.
- *Combined utility burden analysis* excludes households who do not report positive income, do not pay for their electricity, do not pay for their main heating fuel, and/or do not pay for their water costs.

This study does not explore causality and therefore cannot conclude why certain demographic groups or housing types have higher utility burdens than others. Additional research is needed to determine the causes of disproportionate utility burdens, which may include building efficiency, income and poverty rates, and other economic factors. The data for this study is also from 2019, so it does not take into account the impact of COVID-19 on energy and water affordability.

Appendix C. Energy, Water, and Combined Burden Data

ENERGY BURDEN DATA

Table C1. Median energy burden, upper quartile energy burden (25% of households above this burden level), and percent of households with high (>6%) and severe (>10%) energy burdens across income thresholds

Income thresholds	Program(s)	Number of households in DC metro sample	Percent of households in DC metro sample	Median energy burden	Upper quartile (25% above)	Percent high burden (>6%)	Percent severe burden (>10%)
≤200% FPL	WAP	273,055	14%	9.8%	17%	73%	48%
≤60% SMI	LIHEAP, UDP	331,821	18%	7.7%	15%	64%	40%
≤80% AMI	SFA	668,468	35%	4.5%	7.7%	36%	20%
≤100% AMI	CRIAC	842,284	45%	3.8%	6.6%	29%	16%
>200% FPL (non-low-income)	N/A	1,611,601	86%	1.7%	2.8%	3%	0%
>60% SMI	N/A	1,552,834	82%	1.7%	2.6%	2%	0%
>80% AMI	N/A	1,216,188	65%	1.5%	2.2%	0%	0%
>100% AMI	N/A	1042,372	55%	1.4%	1.9%	0%	0%
All households	N/A	1,884,656	84%*	2.0%	3.6%	13%	7%

* The analysis included 84% of households in the sample; 16% of households were filtered out due to lack of energy bill or income data.

Table C2. Median energy burden, upper quartile energy burden, and percent of households with high (>6%) and severe (>10%) energy burdens across demographic factors including race/ethnicity, age, ability, education, and SNAP status

Category	Demographic factors	Number of households in DC metro sample	Percent of households in DC metro sample	Median energy burden	Upper quartile (25% above)	Percent high burden (>6%)	Percent severe burden (>10%)
Race/ ethnicity	White (non-Hispanic)	920,295	49%	1.8%	3.1%	10%	6%
	Black	508,924	27%	2.6%	5%	21%	12%
	Hispanic	225,701	12%	2.5%	4.3%	13%	5%
	Asian	220,267	12%	1.7%	3%	7%	4%
	Other race*	51,322	3%	1.9%	4.2%	17%	5%
Age	Older adults (over 65)	478,866	25%	2.7%	5.1%	22%	12%
	Younger adults (under 65)	1,405,790	75%	1.8%	3.2%	10%	6%
Ability	Member with disability	271,298	14%	2.9%	5.8%	24%	13%

Category	Demographic factors	Number of households in DC metro sample	Percent of households in DC metro sample	Median energy burden	Upper quartile (25% above)	Percent high burden (>6%)	Percent severe burden (>10%)
	No members with disability	1,613,358	86%	1.9%	3.2%	11%	6%
Education	Not high school graduate	126,452	7%	4.0%	7.7%	30%	20%
	High school graduate	272,527	14%	3.1%	5.3%	24%	14%
	Higher education (AA, BA, MA, etc.)	1,259,709	67%	1.7%	2.8%	8%	3%
SNAP status	Receives food stamps	72,268	38%	7%	14.6%	62%	38%
	Does not receive food stamps	920,315	49%	2.5%	4.5%	18%	10%
	All households	1,884,656	84%**	2.0%	3.6%	13%	7%

* Includes households with American Indian/Alaska Native, Hawaiian/Pacific Islander, and/or mixed-race head of households. ** The analysis included 84% of households in the sample; 16% of households were filtered out due to lack of energy bill or income data.

Table C3. Median energy burden, upper quartile energy burden, and percent of households with high (>6%) and severe (>10%) energy burdens across building characteristics such as structure type, tenure status, year built, and heating fuel type

Category	Building characteristics	Number of households in DC metro sample	Percent of households in DC metro sample	Median energy burden	Upper quartile (25% above)	Percent high burden (>6%)	Percent severe burden (>10%)
Structure	Single-family	1,373,740	73%	2.1%	3.7%	13%	7%
	Multifamily (5+ units)	463,109	25%	1.7%	3%	12%	7%
	2-4 units	38,593	2%	2.3%	4.2%	15%	11%
Tenure	Renter	601,851	32%	2.1%	4.1%	16%	9%
	Owner	1,276,325	68%	1.9%	3.4%	12%	6%
Year built	Before 1980	812,614	43%	2.3%	4.4%	16%	9%
	After 1980	1,072,042	57%	1.8%	3.2%	11%	6%
Heating fuel type	Electric heat	952,807	51%	2.1%	4%	15%	9%
	Natural gas heat	923,530	49%	1.9%	3.3%	11%	5%
	All households	1,884,656	84%*	2.0%	3.6%	13%	7%

* The analysis included 84% of households in the sample; 16% of households were filtered out due to lack of energy bill or income data.

WATER BURDEN DATA

Table C4. Median water burden and upper quartile water burden (25% of households above this burden level) across income thresholds

Income thresholds	Program(s)	Number of households in DC metro sample	Percent of households in DC metro sample	Median water burden	Upper quartile (25% above)	Percent high water burden (>4%)
≤200% FPL	WAP	143,524	12%	3%	8.2%	45%
≤60% SMI	LIHEAP, UDP	173,447	13%	2.7%	7.4%	38%
≤80% AMI	SFA	390,174	30%	1.4%	2.9%	19%
≤100% AMI	CRIAC	511,506	40%	1.1%	2.2%	14%
>200% FPL (non-low-income)	N/A	1,149,399	88%	0.5%	0.9%	1%
>60% SMI	N/A	1,119,476	87%	0.5%	0.8%	1%
>80% AMI	N/A	902,749	70%	0.4%	0.7%	0%
>100% AMI	N/A	781,417	60%	0.4%	0.6%	0%
All households	N/A	1,292,923	55%*	0.6%	1%	6%

* The analysis included 55% of households in the sample; 45% of households were filtered out due to lack of water bill or income data.

Table C5. Median water burden and upper quartile water burden across demographic factors including race/ethnicity, age, ability, education, and SNAP status

Category	Demographic factors	Number of households in DC metro sample	Percent of households in DC metro sample	Median water burden	Upper quartile (25% above)	Percent high water burden (>4%)
Race/ ethnicity	White (non-Hispanic)	653,958	51%	0.5%	0.9%	4%
	Black	327,445	25%	0.7%	1.3%	8%
	Hispanic	138,857	11%	0.8%	1.4%	8%
	Asian	161,090	12%	0.6%	0.9%	4%
	Other race*	34,909	3%	0.5%	1.0%	6%
Age	Older adults (over 65)	345,801	27%	0.7%	1.5%	10%
	Younger adults (under 65)	947,122	73%	0.5%	1.0%	4%
Ability	Member with disability	177,144	14%	0.7%	1.3%	8%
	No members with disability	1,115,779	86%	0.6%	1.0%	5%

Category	Demographic factors	Number of households in DC metro sample	Percent of households in DC metro sample	Median water burden	Upper quartile (25% above)	Percent high water burden (>4%)
Education	Not high school graduate	62,757	5%	1.3%	2.7%	21%
	High school graduate	182,284	14%	0.9%	1.6%	11%
	Higher education (AA, BA, MA, etc.)	902,560	70%	0.5%	0.9%	3%
SNAP status	Receives food stamps	33,153	3%	1.0%	3.5%	23%
	Does not receive food stamps	648,050	50%	0.7%	1.3%	8%
	All households	1,292,923	55%**	0.6%	1%	6%

* Includes households with American Indian/Alaska Native, Hawaiian/Pacific Islander, and/or mixed-race head of households. ** The analysis included 55% of households in the sample; 45% of households were filtered out due to lack of water bill or income data.

Table C6. Median water burden and upper quartile water burden across building characteristics such as structure type, tenure status, year built, and heating fuel type

Category	Building characteristics	Number of households in DC metro area	Percent of households in DC metro area	Median water burden	Upper quartile (25% above)	Percent high water burden (>4%)
Structure	Single-family	1,124,391	87%	0.6%	1.1%	6%
	Multifamily (5+ units)	157,581	12%	0.5%	1.0%	6%
	2-4 units	8,528	1%	N/A	N/A	N/A
Tenure	Renter	281,450	22%	0.7%	1.3%	6%
	Owner	1,004,568	78%	0.5%	1.0%	5%
Year built	Before 1980	573,190	44%	0.6%	1.3%	8%
	After 1980	719,733	56%	0.5%	0.9%	4%
Heating fuel type	Electric heat	512,835	40%	0.6%	1.2%	6%
	Natural gas heat	739,806	57%	0.6%	1.0%	6%
	All households	1,292,923	55%*	0.6%	1%	6%

* The analysis included 55% of households in the sample; 45% of households were filtered out due to lack of water bill or income data.

COMBINED ENERGY AND WATER BURDENS

Table C7. Median combined energy and water burden and upper quartile combined burden (25% of households above this burden level) across income thresholds

Income thresholds	Program(s)	Number of households in DC metro area	Percent of households in DC metro area	Median combined burden	Upper quartile (25% above)	Percent high combined burden (>10%)
≤200% FPL	WAP	133,776	11%	14.4%	28%	66%
≤60% SMI	LIHEAP, UDP	162,631	13%	11.2%	22.5%	58%
≤80% AMI	SFA	349,916	29%	6.6%	11.0%	27%
≤100% AMI	CRIAC	466,976	38%	5.1%	8.8%	21%
>200% FPL (non-low-income)	N/A	1,088,967	89%	2.4%	3.7%	1%
>60% SMI	N/A	1,060,112	87%	2.3%	3.5%	0%
>80% AMI	N/A	872,826	71%	2.0%	3.0%	0%
>100% AMI	N/A	755,766	62%	1.9%	2.7%	0%
All households	N/A	1,222,742	51%*	2.6%	4.6%	8%

* The analysis included 51% of households in the sample; 49% of households were filtered out due to lack of energy bill or income data.

Table C8. Median combined energy and water burden and upper quartile combined burden across demographic factors including race/ethnicity, age, ability, education, and SNAP status

Category	Demographic factors	Number of households in DC metro area	Percent of households in DC metro area	Median combined burden	Upper quartile (25% above)	Percent high combined burden (>10%)
Race/ ethnicity	White (non-Hispanic)	625,008	51%	2.3%	3.8%	5%
	Black	302,929	25%	3.2%	5.5%	13%
	Hispanic	128,347	10%	3.5%	6.0%	8%
	Asian	155,742	13%	2.4%	4.1%	7%
	Other race*	30,066	2%	2.7%	5.0%	9%
Age	Older adults (over 65)	316,888	26%	3.5%	5.8%	14%
	Younger adults (under 65)	905,854	74%	2.5%	4.0%	6%
Ability	Member with disability	163,516	13%	3.6%	6.6%	15%
	No members with disability	1,059,226	87%	2.6%	4.3%	7%

Category	Demographic factors	Number of households in DC metro area	Percent of households in DC metro area	Median combined burden	Upper quartile (25% above)	Percent high combined burden (>10%)
Education	Not high school graduate	59,987	5%	5.6%	10.0%	26%
	High school graduate	160,394	13%	4.2%	6.8%	16%
	Higher education (AA, BA, MA, etc.)	863,865	71%	2.2%	3.6%	4%
SNAP status	Receives food stamps	29,461	2%	N/A	N/A	N/A
	Does not receive food stamps	617,765	51%	3.2%	5.5%	12%
	All households	1,222,742	51%**	2.6%	4.6%	8%

* Includes households with American Indian/Alaska Native, Hawaiian/Pacific Islander, and/or mixed-race head of households. ** The analysis included 51% of households in the sample; 49% of households were filtered out due to lack of energy bill or income data.

Table C9. Median combined energy and water burden and upper quartile combined burden across building characteristics such as structure type, tenure status, year built, and heating fuel type

Category	Building characteristics	Number of households in DC metro area	Percent of households in DC metro area	Median combined burden	Upper quartile (25% above)	Percent high combined burden (>10%)
Structure	Single-family	1,077,519	88%	2.8%	4.7%	8%
	Multifamily (5+ units)	136,378	11%	2.0%	3.4%	7%
	2-4 units	6,422	1%	N/A	N/A	N/A
Tenure	Renter	253,362	21%	3.1%	5.0%	9%
	Owner	964,962	79%	2.6%	4.4%	7%
Year built	Before 1980	524,801	43%	3.1%	5.6%	11%
	After 1980	697,942	57%	2.4%	3.8%	5%
Heating fuel type	Electric heat	501,241	41%	3.0%	5.0%	9%
	Natural gas heat	716,505	59%	2.5%	4.1%	7%
	All households	1,222,742	51%*	2.6%	4.6%	8%

* The analysis included 51% of households in the sample; 49% of households were filtered out due to lack of energy bill or income data.

Appendix D. Interview Methodology

Dr. Hernández spearheaded the development of the interview guides to reflect priorities established by DOEE. Interviews were conducted with program staff associated with DOEE's utility assistance programs as well as program participants. The interviews with program staff targeted staff and administrators across the various DOEE programs with organizational oversight. We deliberately chose 10 DOEE employees with experience in one or more programs, those that directly interface with consumers, some with supervisory experience, others that transitioned from one program to another, or led the administration of multiple programs. All 10 program staff that we approached agreed to be interviewed. They were asked standard questions from a semi-structured interview guide, which also allowed for probing and tailoring of questions where appropriate. The guide included questions about the jobs and roles of the participants, descriptions and assessments of the programs they worked for or oversaw, client experiences of the program from their viewpoint, the impact of COVID on program delivery, and any final thoughts. Interviews with program staff were conducted by Dr. Hernández, Ariel Drehobl, and Lauren Ross and lasted one hour on average. Dr. Ross and Ms. Drehobl observed one interview conducted by Dr. Hernández followed by a debrief prior to conducting interviews on their own.

Participant interviews were conducted with 30 recipients of DOEE utility assistance programs between October and December 2020. We sought representation from across the five programs offered by DOEE, including those that had received multiple services. Based on participant data provided by DOEE, we randomly selected participants in each program; those enlisted in more than one program were included in separate spreadsheets.

The research team conducted interview selection based on the following criteria:

- **LIHEAP/UDP**: 10 participants (5 from Wards 1–6, 5 from Wards 7–8)
- **SFA**: 10 participants (5 from Wards 1–6, 5 from Wards 7–8)
- **WAP**: 5 participants (2 from Wards 1–6, 2 from Wards 7–8, 1 from any Ward)
- **CRIAC**: 5 participants (2 from Wards 1–6, 2 from Wards 7–8, 1 from any Ward)

In the end, 28 of the 30 residents interviewed participated in more than one of the programs. DOEE program participants were recruited for interviews by random selection through email and postcard outreach. From October through November 2020, we sent emails to 476 DC residents and postcards to 125 District residents. Ultimately, we recruited 27 participants through email outreach and 3 through postcard outreach. Participants received a $100 Visa gift card by mail for their participation.

Table D1 includes a demographic summary of program participants. Appendix F includes additional information on interview participants.

Table D1. Number of interview participants across demographic and other categories (total of 30)

		Participants (not mutually exclusive)				
Category	Subcategory	LIHEAP/UDP	WAP	SFA	CRIAC	Total (of 30)
Total participants*	N/A	24	8	17	15	30

		Participants (not mutually exclusive)				
Category	Subcategory	LIHEAP/UDP	WAP	SFA	CRIAC	Total (of 30)
Recruitment type	Email	21	6	15	15	27
	Postcard	3	2	2	0	3
District Ward	Wards 1–6	15	4	10	7	16
	Wards 7–8	9	4	6	7	14
Age	29 and under	2	0	1	2	4
	30–39	8	0	3	4	8
	40–49	4	2	4	4	6
	50–59	5	2	4	3	6
	60–69	2	1	2	1	2
	70–79	1	1	2	1	2
	80 and above	1	1	0	0	1
Race/ethnicity	Black/African American**	15	7	12	10	19
	Hispanic	1	0	2	1	2
	White	1	0	0	2	2
	Asian	1	0	1	0	1
Tenure status	Owner	9	5	8	8	14
	Renter	9	3	8	7	15
	Other	1	0	1	0	1
Building type	Single-family	17	8	12	15	23
	Multifamily	7	0	5	0	7

*** 28 of 30 participants indicated that they participated in more than one of the five programs, so that the number participating in each program is not mutually exclusive from other programs. This means the total participants for each category will not equal the sum across the programs. ** This includes households who identified as either Black, African American, or both.**

Dr. Hernández and her research assistants, Tasfia Rahman and Miranda Simes, conducted all participant interviews. Ms. Rahman and Ms. Simes separately observed Dr. Hernández administer one interview, and she observed each of them conduct an interview, after which they debriefed to discuss techniques and ways to improve the administration of interviews. Ultimately, Dr. Hernández led or observed 8 interviews, Ms. Rahman conducted 10 interviews, and Ms. Simes administered 12 interviews. The team used a semi-structured interview guide to move the interviews along. The participant interview guide asked questions about the participant's home and family, participation in the DOEE programs (repeating pertinent questions if enrolled in multiple programs), household bills and financial management strategies, energy efficiency and indoor temperature conditions, household income and expenses, COVID impact, and policy recommendations. Each interview lasted between 30–60 minutes, though most were closer to one hour long. The

team met weekly to review the interviews and discuss any issues encountered while administering the interviews.

All interviews were audio recorded and transcribed verbatim using REV professional transcription services. Interview transcripts were then coded using NVivo version 12 for MAC. We used an open coding methodology to develop a codebook. Open coding is part of a ground theory research method whereby raw research data are first interpreted and systematically analyzed and then categorized. Coding for DOEE program participant interviews included reasons for energy insecurity, coping strategies used to manage financial hardship and thermal discomfort, experiences with various aspects of the DOEE program participation including barriers and facilitators to receiving and benefiting from assistance and navigating local resources, and perceptions of the impact of program participation. Coding for interviews with program staff included domains of personal roles and responsibilities, program descriptions, program assessments, client experiences, and COVID-19 impacts. We discussed the domains as a team to converge on meanings and applications of codes and revisited all transcripts to ensure the systematic application of codes throughout. Ms. Rahman and Ms. Simes led the open coding and codebook development process with oversight from Dr. Hernández.

Following the codebook development and open coding process, Dr. Hernández led the axial coding procedure to identify and assess data patterns, potential causal relationships, contextual factors, and impacting conditions. Axial coding is a technique used to identify core themes during qualitative data analysis through the process of relating codes (categories and concepts) to each other. The results reflect this more interpretive analytical approach, which highlights overarching themes across all participant transcripts, focusing on facets of the programs that are serving participants well along with potential areas of improvement. These insights have also been incorporated into policy recommendations.

Appendix E. Interview Guides

PARTICIPANT INTERVIEW GUIDE

Interview tracking number: _____
Name of interview respondent: _____
Date: _____
Ward: _____
Primary heating fuel: _____

Introduction
We're speaking with you today because we're doing a research study in partnership with DC's Department of Energy and the Environment to better understand people's issues with their homes and energy bills, and your recent experience with DOEE programs.

We'd like to take an audio-only recording that will be used for informational and educational purposes. We'll keep it confidential and we won't use your name. Is it okay if we record the interview?

[Confirm permission to record after the tape recorder is on]

We acknowledge you've already spent a lot of time sharing your personal information with the program staff from (reference program participation). We have some similar questions but our focus here is on your personal story, so we'd like to ask that you answer the questions as honestly as possible. There is no right or wrong answer here. The interview should take about one hour and we will ask you about your home, your household bills and sources of income, and your experiences with the energy assistance program. At the end of the interview, we will confirm your information to send you the $100 gift card. Does this sound ok to you? If so, let's get started.

Your home and family
1. Tell me about your home.
    a. Probe: Do you rent or own? How long have you been living in your current home?
2. What is it like living in your home?
    a. Probe: What do you like best about your home?
    b. Probe: Anything you don't like or would change about your home?
3. Tell me about your family.
    a. Probe: how many people live in the household, ages.
    b. Probe: How would you describe your household in terms of race/ethnicity? What language(s) do you speak at home?
    c. Probe: How old are you and other members of your household?

Participating in DOEE programs
1. Tell us about your experience with—bill assistance through the Low-Income Home Energy Assistance Program (LIHEAP)/ Utility Discount Program (UDP)/ Solar for All (SFA)/ Weatherization Assistance Program (WAP)/ Clean Rivers Impervious Area Charge (CRIAC)?
    a. Probe: What do you know about these programs?
    b. Probe: How did you hear about the program?
    c. Probe: When was the first time you received services and how often do/have you returned?

2. How often do you seek utility (elec, gas, water) support services? (this applies more for LIHEAP/UDP and CRIAC; WAP and SFA are one-time programs)
    a. Probe: every year, only when needed, every other year?
    b. Probe: What factors contribute to when you do/do not decide to apply for services?
3. If you have been involved in more than one program, what is your impression of combining the benefits?
    a. Probe: What are positive aspects, negative aspects of being enrolled in more than one program?
4. Some programs such as LIHEAP currently provide an annual stipend. How would you feel about the assistance being distributed on a monthly basis rather than one large lump sum?
    a. Probe: What are your thoughts about other ways that benefits are delivered such as onsite solar installation, community solar, one-time utility bill credit, monthly utility bill credit, direct cash assistance, etc.
    b. Probe: What is the most helpful to you? Which is hardest for you?
5. Please tell me a little bit about your experience with the application process.
    a. Probe: Based on your experience, do you have any recommendations about what can make the application process easier or simpler?
    b. Probe: How would you feel about being automatically enrolled in the program each year?
6. What has been your experience with the DOEE reaching out to you? Do you feel they have been effective in connecting with you and connecting you to services?
7. Where else do you go (or have you gone in the past) for help with your utility bills?
    a. Probe: How would you compare your experience at DOEE versus these other places?
8. How do your interactions with DOEE compare to your experiences with other organizations or agencies that offer assistance (i.e., food stamps, cash assistance, eviction protection, Department of Aging, Department of Human Resources, etc.)?
    a. Probe: Do you trust DOEE more or less than these alternative agencies?
9. How satisfied do you feel with the service(s)? Why?
    a. Probe: What went well with receiving services? What challenges, if any, did you face with applying for or receiving services?
    b. Probe: How satisfied are you with the customer service aspect of the program? Do the DOEE staff treat you well?
10. Are the services that you have received enough to meet your needs?
    a. Probe: Is it the right kind of help?
    b. Probe: What else would help you better meet your household energy needs?
    c. Probe: Is there a way that they can help families, the elderly, people from different wards, or people that speak languages other than English?
11. What challenges did you face with this program?
    a. Probe: Was it easy to enroll and receive the program benefits?
    b. Probe: Would you change anything about how the office where you apply for services is organized or how it runs?
12. How important is it for you to be environmentally friendly? Is that something that attracts you to the DOEE program(s)? If yes, say more.
13. Overall, what do you like most about participating in the program? Is there anything you would change about the program?

Your household energy and bills

The following questions are about the last year.

1. Please tell me about your household energy use. What sources of energy do you use at home—electricity, natural, fuel oil, propane, kerosene? Any other energy sources?

2. What is your main energy source (typically, natural gas or electricity; less common sources are fuel oil, wood, kerosene and propane) for heating? Cooling? Cooking? Water heater? Appliances?
    a. Probe: Are any of these costs shared by a landlord or included in condo/HOA fees?
3. When you get your utility bills (electric, gas, or water), how do you feel?
    a. Probe: What kind of challenges have you had paying your electricity/gas bill?
    b. Probe: What kind of challenges have you had paying your water bill?
    c. Probe: Have you carried a balance on your electric/gas/water bills?
4. How often have you needed someone else's help to pay the electric/gas/water bill?
    a. Probe: Negotiated a payment plan with the utility company to avoid a shut-off*?*
    b. Probe: Enrolled in budget billing?
5. Have you ever gotten a disconnection notice for your electricity, gas or water service?
    a. Probe: What did you do to avoid the shut off?
    b. Probe: Have you ever lived through a shut-off?
    c. Probe: How were you able to get service back?
6. Tell me about what you've done to save energy or water.
    a. Probe: What strategies or behaviors do you use to reduce energy or water use?
    b. Probe: What about energy/water efficiency measures?
    c. Probe: Have you made any upgrades to your home, appliances, or heating equipment to save energy?
7. What did your parents/household teach you about energy or water? Clarification: This could be to save on your energy/water bills, or it could be just to save energy/water. It can include behaviors or home improvements.
    a. Examples: turn off lights, change the thermostat temperature, upgrade windows or appliances, insulate, change light bulbs, don't let the water run, limit time in showers, etc.
8. Have you ever had to reduce your energy/water consumption to uncomfortable or inconvenient levels to save on your energy bill?
    a. Probe: Tell me more about that and what you've done.

Energy Efficiency and indoor temperatures

1. Overall, how do you feel about the energy efficiency of your home?
    a. Probe: How well-insulated would you say your home is? (By insulation, we mean free of drafts, generally able to feel comfortable in terms of temperature)
2. How do you feel about the temperature in your home during the winter months*?*
    a. Probe: What types of heating equipment do you use?
    b. Probe: During winter, what do you usually do to keep warm in your home?
3. What about the summer?
    a. Probe: What types of cooling equipment do you use?
    b. Probe: During summer, what do you usually do to try to keep cool in your home?
4. Tell me about any changes you've made to improve your comfort in terms of temperature.
    a. Examples: supplemental heating or cooling- stove, space heaters
5. Tell me about any changes you've made to home or behaviors you use to reduce your household energy use and costs.

Your household income and expenses

These questions are about your overall economic situation over the past 12 months. We ask these questions because it will help us to understand how you balance household energy bills and other expenses according to your income.

1. Tell me about how you support your family financially? What are sources of household income for yourself and others?
    a. Salary from work:

   b. Pension/Social Security:
   c. Cash Assistance:
   d. Other sources (i.e., child support, investments):
   e. Probe: if employed, what do you do for work? What is your highest level of education you've obtained?
2. Now I'm going to ask you about household expenses. What are your top three priorities in terms of your household expenses (i.e., housing, food, energy expenses, medical expenses, transportation, childcare costs, other)?
   a. Rent/Mortgage:
   b. Food:
   c. Electricity:
   d. Gas:
   e. Water:
   f. Property taxes (if applicable):
   g. Broadband:
   h. Telephone (home and/or mobile):
   i. Medical expenses:
   j. Transportation:
   k. Childcare costs:
   l. Other household expenses:
3. How do you prioritize different kinds of bills?
   a. Probe: How often do you make decisions between paying utilities and paying for other necessities such as food, medicine, rent, or other basic needs?
   b. Tell me more about that? When? How often?
4. Have you experienced a loss of wages or added costs as a result of the current pandemic?
   a. Probe: How have you coped with these changes?

Closing

Thank you so much for speaking with us. Real people and stories are so important. We're doing this so that we learn, and so that other people learn as well. So we have one last question for you, and that is: who should know about these stories and what we learn?

DOEE PROGRAM STAFF AND ADMINISTRATOR INTERVIEW GUIDE

Interviewee tracking number:
Name of interview respondent:
Job Title:
Date of Interview:

Background Script: Thank you for speaking with me today. For background, my team was awarded a grant from DOEE to provide recommendations on how to improve DOEE's energy affordability programs. To do this, we are conducting an energy burden assessment of the city and we are also conducting interviews with individuals who participated in DOEE's energy affordability programs. Before we conduct interviews with program participants, we are now conducting interviews with key informants who work directly with DOEE's energy affordability programs. We are hoping to hear your perspective on how these programs work, how they can improve, and what's been successful.

To start, I'm going to ask you a few questions about your current position and the program(s) that you work under.

I. Job title and role

1. Please tell me about your current position at DOEE.

a. Probes: What are your day-to-day responsibilities?
b. How long have you worked with the organization—has it always been in the same capacity?
c. What's the most challenging aspect of your job? What is the most rewarding aspect of your job?

II. Program description and assessment

2. Please indicate which program(s) you administer or work under?
    a. LIHEAP, UDP, CRIAC, WAP, SFA

Now we will ask you to describe and assess each of these programs.

b. Probes: How would you describe the mission of this program? [Repeat if involved with multiple programs]
c. How well does this program(s) fit within the larger mission/vision of the DOEE?
d. Please describe the various components of the program such as client outreach, referrals, application, certification, receipt of services, follow-up etc.?
e. Which of these components would you say are going well? Which are not?
f. Are there any recent changes to the program to improve how it operates? *Note: this does not refer to COVID adaptations; we will ask about that later.*
    i. If you could change anything about how this program is run, what would you do differently?
g. How efficiently are you able to provide clients with assistance? How long does the process typically take from start to finish?
h. Besides your program, where else in the DC area might clients receive similar services? In other words, are you part of a larger referral network or are there other well-known entities in the District providing complementary resources? Are there any key programmatic differences between how services are delivered by you and the others?
i. Do you think this program is adequately funded and staffed?
j. What additional information do you wish you had to better serve your clients?

III. Client experiences with energy issues and the programs

3. What are the most significant energy issues presented by clients in your program?
4. What factors do you think contribute most to clients' experience with hardship with their household energy?
5. Please describe your client base in terms of demographic factors such as income/poverty; age of householders—elderly/children; housing tenure (owners/renters), race/ethnicity, immigration status and language proficiency, service areas/wards.
    a. In what ways does your program(s) serve these various populations?
    b. How does the program(s) differentiate its approach(es) to better serve different clients?
    c. Who among these groups is best served and why?
    d. Which populations are underserved and why?
    e. Are you able to offer clients the "right kind of help"? Is the help enough to meet their needs?
    f. What additional supports can be implemented to better address client needs?
6. How common is it for clients to be enrolled in multiple programs offered at DOEE? What are the barriers/facilitators to accessing the other services?
7. What do you think are the most notable impacts of this program from the client's perspective?

IV. COVID and Parting Thoughts/Questions/Comments

8. We would be remiss not to acknowledge the current moment.
    a. How has the COVID pandemic impacted your work and ability to serve clients?

   b. What new pressures does the organization now contend with and how have you all adapted to the current circumstances?
   c. How has the pandemic and accompanying economic fallout affected your clients and, in turn, the demand for services?
9. We have covered a lot in the interview so far; is there anything we missed or that you think is important for us to understand about your program(s)?
   a. Do you have any parting thoughts/questions/comments?

Appendix F. Interview Participant Data

Table F1. Demographic data on interview participants

Identifier	Recruit-ment	Ward	Programs	Age	Race/ ethnicity	Average monthly income of interviewee	Tenure status	Building type
Participant 1	Email	1	LIHEAP/ UDP, SFA	n/a	Asian	$2,500	Owner	Multifamily
Participant 2	Email	4	LIHEAP/ UDP, CRIAC	57	n/a**	$850	Owner	Single-family
Participant 3	Postcard	6	LIHEAP/ UDP, SFA	57	Black, African American	$886	Renter	Multifamily
Participant 4	Email	4	LIHEAP/ UDP, CRIAC	36	Black, African American	Unemployed	Renter	Single-family
Participant 5	Postcard	5	LIHEAP/ UDP, WAP, SFA	51	Black	Unemployed	Renter	Single-family
Participant 6	Email	7	LIHEAP/ UDP, CRIAC	42	Black	$2,166	Renter	Single-family
Participant 7	Email	8	LIHEAP/UDP	29	African American	$988	Renter	Single-family
Participant 8	Email	8	LIHEAP/ UDP, SFA, CRIAC	35	African American	n/a	Renter	Single-family
Participant 9	Email	8	LIHEAP/ UDP	39	African American	n/a	Renter	Multifamily
Participant 10	Email	8	LIHEAP/ UDP	31	Black, African American	$1,200	Renter	Multifamily
Participant 11	Email	5	SFA, CRIAC	44	Hispanic	$7,915	Owner	Single-family
Participant 12	Email	4	LIHEAP/ UDP, SFA	35	African American	$1,007	Renter	Multifamily
Participant 13	Email	6	LIHEAP/ UDP, SFA	63	n/a	n/a	n/a*	Multifamily
Participant 14	Email	3	LIHEAP/ UDP, SFA	74	n/a	$3,000	Owner	Single-family
Participant 15	Email	4	LIHEAP/ UDP, SFA	38	Hispanic	$4,000-$5,000	Owner	Single-family
Participant 16	Email	7	SFA, CRIAC	57	African American	n/a	Renter	Single-family
Participant 17	Email	7	SFA, CRIAC	46	Black	$4,000-$5,000	Owner	Single-family
Participant 18	Email	7	SFA, WAP LIHEAP/ UDP	44	Black, African American	Unemployed	Renter	Single-family
Participant 19	Email	8	SFA, WAP, CRIAC, LIHEAP/ UDP	44	African American	$1,200	Owner	Single-family

Identifier	Recruit-ment	Ward	Programs	Age	Race/ ethnicity	Average monthly income of interviewee	Tenure status	Building type
Participant 20	Email	7	LIHEAP/ UDP, SFA	29	African American	$800-$900	Renter	Multifamily
Participant 21	Email	4	SFA, WAP, CRIAC, LIHEAP/ UDP	62	African American	$883	Renter	Single-family
Participant 22	Email	4	SFA, WAP, LIHEAP/ UDP	50	African American	Unemployed	Owner	Single-family
Participant 23	Email	7	WAP, SFA, CRIAC	71	African American	$2,500	Owner	Single-family
Participant 24	Email	7	WAP, LIHEAP/ UDP	45	Black American	$1,600	Owner	Single-family
Participant 25	Postcard	5	WAP, LIHEAP/ UDP	84	n/a	$1,250	Owner	Single-family
Participant 26	Email	4	LIHEAP/ UDP, CRIAC	32	n/a	Unemployed	Renter	Single-family
Participant 27	Email	4	LIHEAP/ UDP, CRIAC	36	n/a	$1,500–$4,100	Renter	Single-family
Participant 28	Email	8	CRIAC	29	White	$5,000	Owner	Single-family
Participant 29	Email	7	CRIAC	25	African American	$3,700	Owner	Single-family
Participant 30	Email	4	CRIAC, LIHEAP/ UDP	57	White	$2,900–$4,100	Owner	Single-family

* The participant's daughter owns the property and allows the participant to live rent free. ** N/A indicates that interviewees declined to answer the question.