BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Docket No. R-2024-3046523

Duquesne Light Company

Statement No. 5

DIRECT TESTIMONY OF LINDSAY BAXTER

Subject: Building Electrification Portfolio

March 20, 2024

Q. Please state your name and business address.

A. My name is Lindsay Baxter and I work at 411 Seventh Avenue, Pittsburgh, Pennsylvania, 15219.

Q. By whom are you employed and in what capacity?

A. I am employed by Duquesne Light Company as Manager, Regulatory and Clean Energy Strategy. I have worked for the Company since January 2018, previously in the role of Regulatory and Government Affairs Analyst.

Q. What are your qualifications, work experience and educational background?

A. I have more than 15 years of professional experience working in the field of energy and climate policy. Prior to working for Duquesne Light, I was employed by the Pennsylvania Environmental Council, a statewide non-profit organization, for eleven years, most recently in the role of Program Manager, Energy and Climate. From 2008-2011, I was employed by the City of Pittsburgh in the role of Sustainability Coordinator. I hold a Bachelor of Arts degree in Environmental Studies from Allegheny College, a Master of Science degree in Environmental Science and Management from Duquesne University, and a Certificate in Renewable Energy from Saint Francis University.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to provide information on a suite of pilot programs being proposed by the Company to advance beneficial end uses of electricity in homes and buildings.

Q. Are you sponsoring any exhibits at this time?

A. Yes. Attached are the following exhibits:

- Exhibit LB-1, a proposed evaluation plan; and
- Exhibit LB-2, results of a baseline survey of customer perceptions on this topic.

OVERVIEW: BUILDING ELECTRIFICATION PROGRAMS

Q. What is "beneficial electrification?"

A. Beneficial electrification strategies are those that prioritize three forms of societal benefits: reduced overall energy consumption, lower consumer costs, and reduced environmental impact. Opportunities for beneficial electrification exist across all sectors. Examples include transportation electrification; building electrification, such as the use of efficient heat pumps for heating and cooling, heat pump hot water heaters, induction stoves, and other electric appliances; and electrification of agricultural and industrial processes. Of note, some technologies, like heat pump water heaters, induction stoves, and electric lawn equipment demonstrate benefits to consumers today in terms of energy savings, air quality, and reduced environmental impact.

Duquesne Light first received authorization to offer transportation electrification programs in its 2018 base rate case proceeding (Docket No. R-2018-3000124) and subsequently expanded those programs in its 2021 rate case (Docket No. R-2021-3024750). The Company's transportation electrification programs are described in detail in Statement No. 6. This testimony focuses on opportunities for building electrification where it provides benefits to customers.

Q. Why is Duquesne Light proposing building electrification programs in this case?

A. More and more customers are adopting electrification technologies in their homes and businesses, resulting in changing load and usage patterns. With advances in technology, shifting customer preferences, changes in the policy environment, and additional federal and state-level funding becoming available, the building electrification market is expected to continue to grow over the coming years. According to the Energy Information Administration ("EIA"), more than 17 million households in the U.S. used heat pumps for space heating in 2020, a 28% increase compared to 2015.[1] [2] The residential heat pump market is expected to grow from roughly $15 billion in 2020 to almost $24 billion by 2030.[3] Similarly, according to the U.S. International Trade Commission, the U.S. heat pump water heater ("HPWH") market doubled between 2016 and 2020, with sales of ENERGY STAR-certified units increasing from 52,000 units in 2016 to 104,000 in 2020. However, HPWHs constitute a relatively small share of the water heater market, accounting for 2% of market sales in 2020.[4] Federal investment in building electrification is expected to further accelerate these trends toward electrification of building end uses. The Infrastructure Investment and Jobs Act ("IIJA") and

[1] "RECS Survey Data, 2020." *Residential Energy Consumption Survey (RECS)*. EIA, https://www.eia.gov/consumption/residential/data/2020/.
[2] "RECS Survey Data, 2015." *Residential Energy Consumption Survey (RECS)*. EIA, https://www.eia.gov/consumption/residential/data/2015/.
[3] Analysis based on a growth model for the US residential heat pump market developed from GMI data, accessible here: https://www.gminsights.com/industry-analysis/us-residential-heat-pump-market.
[4] Brian Diagle and Andrew David. "Residential Heat Pump (Hybrid) Water Heater Market, Production, and Trade." U.S. International Trade Commission. Executive Briefings on Trade. February 2022. https://www.usitc.gov/publications/332/executive_briefings/ebot_residential_heat_pump_hybrid_water_heaters.pdf/.

Inflation Reduction Act ("IRA") provide for historic investment in building electrification in the form of grants, tax incentives, and rebate programs. However, even with federal or state funding available, many consumers who wish to electrify end uses in their homes or businesses will still face an upfront cost barrier. Duquesne Light can play a role in helping customers who wish to electrify end uses in their homes to overcome the first cost barrier.

Furthermore, it is critical that Duquesne Light, as the distribution grid operator, monitor these changes and adapt to address impacts to the grid. As trends toward increased electrification continue, the location of new electrification technologies with respect to the grid and the timing of their use may have impacts on grid reliability and operational costs. Developing these programs allows the Company to play a role in the transition, gaining visibility into customer adoption of electrification technologies, monitoring any grid impacts, and gathering important learnings to inform future planning and operations. Further, as the local electric distribution utility, Duquesne Light touches all customers in its service territory, and thus is in a unique position to educate customers not only on electrification options but also on the potential federal and state programs for which they may qualify.

The purpose of this initial three-year pilot is to begin to meaningfully address barriers to beneficial electrification in buildings, including a lack of awareness and education on technology options; upfront costs; and need for a more robust contractor network educated in and actively offering beneficial

electrification. Core to these programs is equity, affordability, and environmental consciousness.

Q. Are there examples of other building electrification programs in other areas of the United States?

A. Yes. A 2022 study by the American Council for an Energy-Efficient Economy ("ACEEE") identified 42 programs in 17 states.[5] This number represents an increase from 22 programs identified in 2020. Most programs are administered by utilities and focus on residential and small commercial customers. According to this study, 78% of programs are partially or fully funded by utility rates.[6]

Examples of utility-led building electrification programs include the following, noting that this is not an exhaustive list: Burlington Electric Department's (VT) Net Zero Energy City program;[7] Eversource's (CT) Energize Connecticut program;[8] Holy Cross Energy's (CO) Beneficial Electrification program;[9] Orcas Power & Light Cooperative's (WA) Switch It Up! Program;[10] Sacramento Municipal Utility Department's (CA) Advanced Homes Electrification and Home Appliance programs;[11] Southern California Edison's (CA) Clean Energy and Resiliency program;[12] Tennessee Valley Authority's (TN) Electrification Rebates for

[5] Cohn, C., and N. W. Esram. 2022. *Building Electrification: Programs and Best Practices.* Washington, DC: American Council for an Energy-Efficient Economy. aceee.org/researchreport/b2201.
[6] See 5 at page 65.
[7] "Net Zero Energy Burlington Vermont." Burlington Electric Department. https://www.burlingtonelectric.com/nze/.
[8] "Helping Connecticut make smart energy choices." Energize Connecticut. https://energizect.com/.
[9] "Smart Electric Rebates." Holy Cross Energy. https://www.holycross.com/beneficial-electrification/.
[10] "Switch It Up!" OPALCO. https://www.opalco.com/save/the-island-way/switch-it-up/.
[11] "A whole house approach to energy efficiency." SMUD. https://www.smud.org/en/Rebates-and-Savings-Tips/Improve-Home-Efficiency.
[12] "Clean Energy and Resiliency (CLEAR) Rebuilt Program." Southern California Edison. 2019. https://211ventura.org/wp-content/uploads/2020/08/SCE-CLEAR-Flyer-02242020.pdf.

Commercial and Industrial;[13] and Wabash Valley Power Alliance (IN) Power Moves Program.[14]

Several states have adopted policies to encourage or require building electrification. In some states, existing energy efficiency policies have been updated to include beneficial electrification. While these building policies and programs are often found on the west coast or in the northeast, examples from other parts of the country include Minnesota's Energy Conservation and Optimization (ECO) Act, Illinois's Climate and Equitable Jobs Act (CEJA), and Colorado's SB21-246, all signed in 2021.

Q. Are Duquesne Light's proposed building electrification programs consistent with Pennsylvania policy?

A. Yes. While Pennsylvania has not adopted any laws specific to building electrification, these programs are consistent with direction set through various state actions. Examples from the past five years include:

- In September 2023, the U.S. Climate Alliance—a bipartisan coalition of which Pennsylvania is a member—announced a goal to quadruple heat pump installations by 2030.[15] Specifically, Governor Shapiro committed Pennsylvania to explore clean heat standards and to support adoption of

[13] "Save money and meet efficiency goals with energy incentives for businesses." TVA EnergyRight. https://energyright.com/business-industry/incentives/.
[14] "Saving money and energy." Wabash Valley Power Alliance. 2024. https://www.wvpa.com/saving-energy-money/.
[15] "U.S. Climate Alliance Announces New Commitments to Decarbonize Buildings Across America, Quadruple Heat Pump Installations by 2030." United States Climate Alliance. September 21, 2023. https://usclimatealliance.org/press-releases/decarbonizing-americas-buildings-sep-2023/.

advanced efficiency building codes to maximize opportunities for electrification.

- The State's most recent Climate Action Plan (2021) details strategies to reduce statewide greenhouse gas emissions and achieve the state's climate change goals. One strategy detailed in the report is incentivizing electrification of residential and commercial buildings. According to the analysis, building electrification could result in a 483,807 $MTCO_2e$ annual greenhouse gas emission reduction in 2025 and 12,288,250 $MTCO_2e$ annual reduction in 2050.[16]
- Executive Order 2019-01 issued by Governor Wolf on January 8, 2019 set the following goal: The Commonwealth shall strive to achieve a 26% reduction of net greenhouse gas emissions statewide by 2025 from 2005 levels, and an 80% reduction of net greenhouse gas emissions by 2050 from 2005 levels.[17]

Q. Are Duquesne Light's proposed building electrification programs consistent with local policy and initiatives?

A. Yes. In 2015, then-Pittsburgh Mayor Peduto announced his "2030 Goals", which included reducing citywide emissions, as well as citywide energy usage by 50%; utilizing 100% renewable energy in all City facilities; and creating a fossil-fuel-free

[16] Pennsylvania Department of Environmental Protection. *Pennsylvania Climate Action Plan 2021*. Pennsylvania Department of Environmental Protection, September 2021. www.depgreenport.state.pa.us/elibrary/GetDocument?docId=3925177&DocName=2021%20PENNSYLVANIA%20CLIMATE%20ACTION%20PLAN.PDF%20%20%3cspan%20style%3D%22color:green%3b%22%3e%3c/span%3e%20%3cspan%20style%3D%22color:blue%3b%22%3e%28NEW%29%3c/span%3e%209/21/2023.

[17] Executive Order Number 2019-01. Commonwealth of Pennsylvania Governor's Office. January 8, 2019. https://www.oa.pa.gov/Policies/eo/Documents/2019-01.pdf.

City fleet.[18] These commitments were codified by a 2017 Executive Order.[19] In 2018, the City of Pittsburgh released its Climate Action Plan 3.0, which emphasizes the role of buildings in meeting the City's climate change mitigation goals. Based on a 2013 greenhouse gas inventory, 82% of greenhouse gas emissions in Pittsburgh come from buildings and the use of energy within buildings.[20] Accordingly, the Climate Action Plan 3.0 establishes objectives related to buildings, including ensuring that all new buildings are carbon neutral by 2030 and improving energy efficiency in existing residential buildings.[21]

Additionally, the Allegheny County Controller's office has issued climate action recommendations that include a significant role for electrifying transportation. The recommendations expand beyond vehicles to also include lawn equipment: "To further the County's reduction of harmful emissions, outdoor light maintenance equipment must be a part of the solution. Electric mowers, trimmers, chain saws, blowers, and other small equipment are becoming more readily available. Not only will electrifying this category of equipment reduce our GHGs but doing so will also improve the air quality in our County parks. Small equipment powered by gasoline produces localized volatile organic compounds and other emissions that are harmful to the public and our employees' health."[22]

[18] Press Release, November 9, 2021. https://pittsburghpa.gov/press-releases/press-releases/5445.
[19] "Reinforcing Pittsburgh's Commitment to the Global Partnership on Climate Change." Executive Order Number 2017-08. City of Pittsburgh, Office of the Mayor. June 2, 2017. https://apps.pittsburghpa.gov/mayorpeduto/Climate_exec_order_06.02.17_(1).pdf.
[20] "Climate Action Plan 3.0." City Channel Pittsburgh. September 8, 2018. https://www.youtube.com/watch?v=VcUqkRhYV6E.
[21] *Climate Action Plan Version 3.0*. City of Pittsburgh, Department of City Planning. 2018. https://apps.pittsburghpa.gov/redtail/images/7101_Pittsburgh_Climate_Action_Plan_3.0.pdf.
[22] Allegheny County Controller Climate Action Recommendations https://alleghenycontroller.com/climate-action-recommendations/

In addition, other local communities in the Duquesne Light service territory are pursuing more sustainable buildings. For example, in 2018, Forest Hills Borough constructed a net-zero energy municipal facility to meet the Borough's need for new facilities and to align with the Borough's sustainability goals. The building—which was designed with highly energy-efficient elements, a geothermal HVAC system, a heat pump, and an on-site solar PV system—performs at the LEED Gold Level, the second-highest designation from the U.S. Green Building Council, and demonstrates operational cost savings for the Borough.[23] Also in 2018, the Carnegie Library of Pittsburgh (CLP)—Carrick was constructed as a highly efficient, all-electric building. CLP—Carrick become the first library in North America to receive a Passive House certification and demonstrates operational cost savings.[24]

In addition to local government, there are a number of related efforts in the Pittsburgh community aimed at increasing energy efficiency and emissions reductions in the building sector. For example, the Pittsburgh 2030 District, coordinated by the Green Building Alliance, aims to reduce greenhouse gas emissions from participating buildings 50-65% by 2030 and attain zero emissions by 2040. The Pittsburgh 2030 District, the largest such district in North America, is made up of 550 properties representing 87.1 million square feet. The Pittsburgh 2030 District buildings have together reduced 2.5 million metric tons of greenhouse

[23] "Forest Hills Municipal Building." Volpatt Construction. 2020. https://volpatt.com/project/forest-hills-municipal-building/.
[24] "CLP – Carrick: Sustainability For The Future." Carnegie Library of Pittsburgh. 2024. https://www.carnegielibrary.org/about-carnegie-library-of-pittsburgh-carrick/carricksustainability/

gas emissions and saved over $393 million in utility costs since the 2030 District's inception nearly a decade ago.[25]

Duquesne Light's proposed building electrification programs are aligned with and supportive of local policy and initiatives in the larger Pittsburgh community aimed at improving building energy efficiency and sustainability.

Q. What building electrification programs are being proposed?

A. To advance beneficial electrification in the built environment, the Company is proposing the following programs, which are described in further detail below:

1) Building Electrification Awareness, Education, and Engagement (AEE) Program;

2) Workforce Development and Contractor Network Program;

3) Customer Incentive Program. Rebates will be offered for heat pump water heaters, electric induction stoves, and electric lawn equipment. Additionally, the Company is proposing a "make ready" pilot for residential electrical upgrades.

Q. What is the timeline for the proposed pilot?

A. We are proposing a three-year pilot to begin in January 2025 and run through December 2027. Because the electrification sector is evolving, a three-year timeframe is appropriate to launch programs and gather initial learnings to inform future program design. While Duquesne Light anticipates offering electrification programs beyond 2027, a three-year time frame allows us to be nimble, continuing

[25] *Pittsburgh 2030 District: 2022 Annual Progress Report*. Green Building Alliance. May 2023. https://gba.org/media/2423/pittsburgh-2030-district-progress-report-2022-for-web.pdf.

to evolve programs to meet advances in technology, shifting economics, and a growing contractor base, to ensure customer offerings remain relevant, effective, and beneficial to all customers. If the Company does not pursue a distribution rate case filing in 2027, the Company will continue offering the proposed portfolio.

TOPIC 1: BUILDING ELECTRIFICATION AWARENESS, EDUCATION, AND ENGAGEMENT PROGRAM

Q. Please describe the proposed Building Electrification Awareness, Education, and Engagement Program.

A. A known barrier to adoption of beneficial electrification is a lack of awareness and understanding. Pennsylvania's 2021 Climate Action Plan acknowledges this, noting "Broad electrification is still challenged by its lack of cost-effectiveness and limited customer awareness and confidence in the technologies."[26] Consistent with this finding, in an August 2023 survey of Duquesne Light residential customers, only 28% of respondents self-identified as somewhat or very familiar with heat pump water heaters (HPWHs). Slightly more customers had familiarity with heat pumps for heating and cooling, with 35% of customers identifying as somewhat or very familiar, and an additional 4% of respondents indicating they currently owned a heat pump.

[26] Pennsylvania Department of Environmental Protection. *Pennsylvania Climate Action Plan 2021*. Pennsylvania Department of Environmental Protection, September 2021. Page 51. www.depgreenport.state.pa.us/elibrary/GetDocument?docId=3925177&DocName=2021%20PENNSYLVANIA%20CLIMATE%20ACTION%20PLAN.PDF%20%20%3cspan%20style%3D%22color:green%3b%22%3e%3c/span%3e%20%3cspan%20style%3D%22color:blue%3b%22%3e%28NEW%29%3c/span%3e%209/21/2023.

The Company is proposing a robust AEE program, in part modeled off of the success and lessons learned through its transportation electrification AEE programming. Duquesne Light is uniquely positioned to answer some of its customers questions regarding electrification technologies. For instance, in the aforementioned survey, 46% of customers indicated uncertainty regarding how adoption of a HPWH would impact utility bills. Duquesne Light is best positioned to answer that question.

Q. How does the Company plan to reach customers through its AEE program?

A. The Company intends to develop and implement a multi-channel outreach program that utilizes the existing Company website, new web tools, in-person and community-based events, and traditional and social media. Where possible, the Company will look for opportunities to partner with trusted organizations to help deliver the message to customer audiences. Additionally, Duquesne Light will leverage its experience providing AEE programming related to transportation electrification, and look for synergies between programs, where possible.

Q. Does the Company intend to engage low-income customers and communities?

A. Yes. The Company intends to partner with community organizations who are trusted by community members to share information on building electrification opportunities and, specifically, the programs it offers. Because the Company has carved out a portion of its rebate budget specifically for low-income customers, it has motivation to reach this audience. Additionally, as the workforce development component evolves, the Company will seek to engage disadvantaged communities in these opportunities.

Recognizing that residents of low-income communities may face barriers that make them unable to fully access the benefits of building electrification, the Company's outreach will not be solely focused on promoting current rebates, but will seek to connect communities to other resources that may help them to become more electrification-ready.

Q. Does the Company intend to engage small business customers through this programming?

A. Yes. As part of its Awareness, Education, and Engagement program, the Company intends to provide outreach to small businesses in its service territory on the benefits of electrification and available support, such as the existing Small Business Advantage Grant program, as well as new programs being rolled out as a result of the Inflation Reduction Act.

TOPIC 2: WORKFORCE DEVELOPMENT AND CONTRACTOR NETWORK PROGRAM

Q. Please describe the proposed Workforce Development and Contractor Network Program.

A. A lack of qualified contractors with training in building electrification technologies is a barrier to adoption. Most customers rely on the advice of a trusted contractor when making decisions about home repairs and major appliance replacement, as noted in an ACEEE study of electrification programs: "Customers are likely to rely on contractors to communicate the value of home energy decisions. By providing training, certification, and incentives to contractors who prioritize heat pumps,

water heating, and induction cooking measures, the building energy contracting workforce can become a vital partner in the effort to electrify every home and building in the United States."[27]

Workforce development must focus on upskilling existing electricians, plumbers, and HVAC technicians, while simultaneously growing a pipeline of new workers entering the trades. Duquesne Light has built existing relationships with a number of workforce partners in its service territory and the larger region, such as Partner4Work; Pittsburgh Gateways; A. Philip Randolph Institute; and Pennsylvania College of Technology. It plans to leverage these existing relationships and draw on resources and trainings available through equipment manufacturers to facilitate development of the electrification workforce in the Pittsburgh region.

Additionally, the Company plans to build a network of installation contractors and other relevant building service professionals to be partners in advancing Company offered programs as well as complementary federal or state programs. Providing information on programs to contractors helps them to provide more value to their customers and helps customers to adopt clean energy solutions.

TOPIC 3: CUSTOMER INCENTIVES FOR BUILDING ELECTRIFICATION

Q. What customer incentives is Duquesne Light proposing?

A. The Company is proposing a modest pilot incentive program to support customers adopting heat pump water heaters; electric induction stoves; and electric lawn equipment, along with a make-ready rebate towards wiring and panel upgrades

[27] Cohn, C., and N. W. Esram. 2022. *Building Electrification: Programs and Best Practices.* Washington, DC: American Council for an Energy-Efficient Economy. Pg. 65-66 aceee.org/researchreport/b2201.

necessary to implement electrification. Each of these is discussed in more detail below. The Company will retain the right to change incentive amounts based on customer behavior, response rate, and market conditions to further test the impact of the incentive value on customer behavior. The Company will also retain the right to reallocate funds between incentive programs based on customer uptake. Additionally, the Company will monitor the status of federal and state rebate programs related to residential building electrification and reserves the right to make adjustments to the Company's pilot incentive program to appropriately incentivize measures and customer behavior.

Q. Which customers will be eligible for the proposed incentives?

A. The Company is proposing to offer these rebates for residential customers. As a pilot, the intent is to initially develop programs for the residential customer class that can be built upon and expanded to other customer types in the future, if appropriate. The Company determined it was most feasible to initially offer building electrification incentives to residential customers as there is more uniformity amongst residential projects, such as water heaters and stoves. Building electrification programs for commercial customers may require more customization. The Company will continue to serve these customers through its existing programs including transportation electrification and Act 129 Energy Efficiency and Conservation programs, as well as support them in accessing federal and state incentives, as discussed above.

It is important to note, though, that the awareness, education and engagement, as well as the workforce and contractor development aspects of this

portfolio will serve all customers. It is only the rebates that are currently proposed to be limited to residential customers.

Q. Please describe the proposed Heat Pump Water Heater Pilot Incentive Program.

A. The Company is proposing to offer an incentive program to support adoption of heat pump hot water heaters (HPWHs) by residential customers. Under the new proposed program, upon submission of proof of installation, the Company will issue a rebate to offset the incremental cost of a more efficient HPWH. According to the U.S. Energy Information Administration, the typical total installed cost of a HPWH is $2230, compared with $1690 for a natural gas-fired water heater and $1310 for an electric resistance water heater.[28] The Company plans to partner with plumbers, electricians, and other installation contractors to facilitate customer participation in the program.

Under its existing Act 129 Energy Efficiency and Conservation program the Company currently offers a $300 rebate on ENERGY STAR-certified HPWHs,[29] The proposed rebate would be a new offering, in addition to the existing rebate. The interaction between the proposed building electrification rebates and the existing energy efficiency rebates is discussed in greater detail in my testimony.

Q. **Why did you choose to develop a program focused on HPWHs?**

[28] *Updated Buildings Sector Appliance and Equipment Costs and Efficiencies*. U.S. Energy Information Administration. March 2023. https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf.

[29] Duquesne Light Company – Revised Phase IV Energy Efficiency and Conservation Plan. March 1, 2021. M-2020-3020818. www.puc.pa.gov/pcdocs/1695570.pdf

A. Water heating represents the second highest energy usage in the average home, following space heating and cooling, and thus represents a significant opportunity for customers to reduce their energy consumption, emissions, and energy-related expenses. As compared to heat pumps for heating and cooling, which represent a larger expense and a significant building system change, HPWHs are a less complex, more "plug and play" option for customers wishing to electrify new end uses in their homes. According to data from ENERGY STAR, sales of heat pump water heaters grew 26% in 2022 while sales of gas water heaters declined by 17% over the same period.[30] However, HPWHs still account for less than two percent of the water heater market. This growth in the HPWH market is largely driven by utility and state incentives, particularly in California but also in the Pacific Northwest and Maine.

Heat pump water heaters provide annual energy savings ranging from $270 to $550, with lifetime energy savings up to $5,610.[31] Pennsylvania customers should not be left behind. The proposed incentives will help to grow the market for HPWHs in southwestern Pennsylvania, while providing more installation experience to contractors and encouraging more distributors to carry HPWH inventory.

Q. Please describe the proposed Induction Stove Pilot Incentive Program.

[30] Joseph Wachunas, "Heat Pump Water Heater Sales in 2022 Signal a Decisive Shift in Water Heating Trends." New Buildings Institute. October 12, 2023. https://newbuildings.org/heat-pump-water-heater-sales-in-2022-signal-a-decisive-shift-in-water-heating-trends/

[31] "Is a Heat Pump Water Heater Right for Your Home?" Energy Star. https://www.energystar.gov/products/ask-the-experts/heat-pump-water-heater-right-your-home.

A. The Company is proposing an incentive program targeted to residential customers for purchase of an induction stove or cooktop. According to the Department of Energy, induction stoves are more energy efficient than alternative options—up to three times more efficient than a natural gas stove and up to 10% more efficient than a glass top electric range.[32] In addition to energy efficiency benefits, induction cooking provides health and safety benefits. Because the surface of the cooktop does not get hot, the opportunity for fires or burn injuries is reduced. Additionally, the absence of indoor combustion of fossil fuels improves air quality by reducing nitrous oxides, carbon monoxide, and formaldehyde. These health improvements are more pronounced for those with respiratory conditions. This benefit is particularly important in Duquesne Light's service territory, where asthma rates are higher than average.[33] The Asthma and Allergy Foundation of America has ranked Pittsburgh 53rd of the 100 cities where it is most difficult to live with asthma. [34]

Induction ranges have historically been more expensive than conventional electric or gas models. The cost of a typical induction range is between $1,100 to $4,400,[35] compared with $770 for a natural gas range and $630 for an electric range.[36] While prices have continued to decrease, this price differential can be a

[32] Vivien Bui, "Making the Switch to Induction Stoves or Cooktops." U.S. Department of Energy. May 11, 2023. https://www.energy.gov/articles/making-switch-induction-stoves-or-cooktops#:~:text=Induction%20appliances%20are%20up%20to,pollution%20associated%20with%20energy%20generation.

[33] In particular, childhood asthma rates in Allegheny County are 11%, compared to the national average of 8.3%. (See Reid Frazier. "Study: Pittsburgh kids near polluting sites have higher asthma rates." State Impact Pennsylvania. November 11, 2020. https://stateimpact.npr.org/pennsylvania/2020/11/11/study-pittsburgh-kids-near-polluting-sites-have-higher-asthma-rates/.)

[34] "Asthma Capitals." Asthma and Allergy Foundation of America. https://aafa.org/asthma-allergy-research/our-research/asthma-capitals/.

[35] Kevin Purdy, "How Much Does an Induction Stove Cost?" Carbon Switch. https://carbonswitch.com/induction-stove-costs-and-prices/.

[36] *Updated Buildings Sector Appliance and Equipment Costs and Efficiencies*. U.S. Energy Information Administration. March 2023. https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf.

barrier for customers who otherwise would adopt this cleaner, safer technology. Duquesne Light proposes a one-time rebate for residential customers to assist with the cost of an induction range or cooktop.

Q. Please describe the proposed Lawn Equipment Pilot Incentive Program.

A. Duquesne Light is proposing an incentive program for electric lawn equipment targeted to residential customers. Through this program, customers will have the opportunity to electrify an end use in their home and experience the benefits of all-electric appliances first-hand as an entry point in their beneficial electrification journeys. Customers will benefit from improved air quality, reduced noise pollution, and increased energy efficiency. Upon submission of proof of purchase of qualifying equipment, residential customers will receive a rebate. A qualified product list will be developed and may include electric lawn mowers, leaf blowers, trimmers, and/or snow blowers.

Q. Why are you proposing an incentive program for lawn equipment?

A. Lawn and garden equipment constitute a significant source of air pollution in the U.S. Gasoline-powered lawn and garden equipment emits harmful air pollutants, including nitrogen oxides (NO_x), volatile organic compounds (VOCs), carbon dioxide (CO_2), carbon monoxide (CO), methane (CH_4), and particulate matter (PM 2.5). NO_X and VOCs emissions contribute to the formation of ozone and haze. Combustion of gasoline from these engines also emit formaldehyde and benzene, which are known to be harmful to human health.

The Pittsburgh metro area has well-known air quality challenges, especially related to particulate matter and ozone. According to the American Lung

Association, the Pittsburgh metro area ranks among the 25 worst metro areas in the country for particle pollution. [37] An October 2023 report from Environment America and U.S. PIRG found that in 2020, lawn and garden equipment in Allegheny County emitted 103,845 tons of carbon dioxide, equivalent to 22,861 cars on the road.[38] According to the same report, Allegheny County ranked 55th in the nation for carbon dioxide emissions from lawn and garden equipment.

While electric lawn and garden equipment is not zero-emissions, it does not produce emissions directly on-site at ground level. Rather, the emissions come for a generating facility with appropriate air pollution controls and monitoring. Additionally, electric engines are more efficient than gas-powered ones and less carbon-intensive. According to one study, residential electric push mowers result in 49.9% fewer lifetime CO_2 emissions compared to their gasoline-powered counterparts. [39] Similarly, electric riding mowers reduce carbon dioxide emissions by 32.3% compared with the gasoline-powered version over their lifetime. Further, as the electric power grid continues to become less carbon-intensive, these devices contribute greater air quality benefits. In addition to air quality improvements, electric lawn equipment is often much quieter than the gasoline version, leading to improved occupational safety for workers and an overall community benefit.

[37] "New Report: Pittsburgh Metro Area's Air Quality Improves to Best Ever for Ozone Moving from 'F' Grade to 'C', Continues to Rank Among Most Polluted in U.S. for Both Short-Term and Year-Round Particle." American Lung Association. www.lung.org/media/press-releases/pittsburgh-sota-2023.
[38] *Lawn Care Goes Electric*. Environment America Research & Policy Center and U.S. PIRG Education Fund. 2023. https://publicinterestnetwork.org/wp-content/uploads/2023/10/Lawn_Care_Goes_Electric_Oct23.pdf
[39] Michael Saidani and Harrison Kim, "Quantification of environmental and economic benefits of the electrification of lawn mowers on the US residential market," The International Journal of Life-Cycle Assessment, 26: 1267–1284, April 27, 2021, doi: 10.1007/s11367-021-01917-x.

Historically, electric lawn equipment has had a higher upfront cost than conventional gasoline-powered lawn equipment. For example, a typical electric battery-powered push lawn mower costs $450 compared with $300 for a typical gasoline-powered push lawn mower.[40] There is precedent of utility rebates for electric lawn equipment, such as that being proposed by the Company. As an example, all seventeen electric utilities in the state of Vermont offer incentives for electric lawn and garden equipment.[41] Additional examples of rebates for electric lawn and garden equipment exist in many jurisdictions, including Mass Save in Massachusetts,[42] Nebraska Public Power,[43] and Clark County Rural Electric Membership Corporation, a distribution cooperative in Indiana.[44]

The Pittsburgh region has had incentives for electric lawn equipment in the past, offered through the Allegheny County Health Department. However, these programs were subject to funding availability and are not currently offered. Additionally, the Inflation Reduction Act (IRA) provides up to a $7,500 tax credit for commercial grade lawn mowers.[45] The IRA does not include any incentives for non-commercial lawn equipment. The Company is not aware of any programs to support its residential customers in adopting electric lawn equipment today.

[40] Based on Duquesne Light Company market analysis, conducted in January 2024.
[41] "Utility Incentives." Mow Electric. 2023. https://www.mowelectric.org/utility-incentives. Electric lawn equipment is an allowable measure under Vermont's Renewable Energy Standard (Act 5) Tier III.
[42] "Lawn equipment." Mass Save. 2024. https://www.masssave.com/residential/rebates-and-incentives/appliances-and-products/lawnequipment
[43] "Incentives for your lawn and garden." Nebraska Public Power District. 2024. https://nppd.energywisenebraska.com/lawngarden/
[44] "Electric Outdoor Equipment Rebates." Clark County REMC. 2024. https://www.clarkremc.coop/energy-efficiency/rebates/electric-outdoor-equipment-rebates/
[45] "Inflation Reduction Act Features Tax Credit for Commercial Grade Electric Lawn Mowers." National Association of Landscape Professionals. 2023. https://blog.landscapeprofessionals.org/inflation-reduction-act-features-tax-credit-for-commercial-grade-electric-lawn-mowers/

Q. Please describe the proposed Make Ready Pilot for Residential Electrical Upgrades.

A. The Company proposes a make ready pilot to assist residential customers with the necessary electrical upgrades that may be required to implement a customer's beneficial electrification projects. It is generally believed that for most homes, 200 amps of electric current will be enough to electrify a home. However, the median age of a home in the Pittsburgh region is 82 years, with 49% of homes built prior to 1940.[46] In comparison, the national median home age is 42 years, with only 12% of homes constructed prior to 1940. Given the older housing stock in Pittsburgh and the surrounding area, many homes may only have 100-amp service, necessitating an electrical panel upgrade. In addition to the electrical panel, many major electric appliances require a 220V connection resulting in the need for wiring upgrades of specific circuits within the home. Both a panel upgrade and the wiring of new circuits can be an additional, and potentially costly, barrier to electrification and one that may be overlooked by some customers. A typical electric panel upgrade costs $2000 and a wiring upgrade costs $1100, representing a significant cost to many households.[47]

Q. Will all residential electrical upgrades be eligible for the make ready rebate?

A. No, not all residential electrical upgrades are eligible. Rebates are limited to the wiring of new circuits or upgrading the electric panel as the result of installing one

[46] Michael Korsh and Anya Sostek. "New Census data illustrates the Pittsburgh region's resiliency--and its lingering disparities." Pittsburgh Post-Gazette. September 18, 2023. https://www.post-gazette.com/local/city/2023/09/17/pittsburgh-census-american-community-survey/stories/202309170131

[47] "Wire your home for electrification." Rewiring America. https://homes.rewiringamerica.org/projects/electrical-panel-homeowner.

or more of the following qualified appliances: electric vehicle charger, heat pump for heating/cooling, heat pump water heater, induction stove, or heat pump clothes dryer.

Q. Regarding all customer rebates, is Duquesne Light proposing specific programs dedicated to low-income customers?

A. All residential customers, including low-income, are eligible for the proposed customer rebates. Recognizing that low-income customers may face challenges to accessing utility programs, such as lack of access to a computer or reliable internet, or inflexible work schedules to make phone calls, the Company is reserving a portion of rebates specifically for low-income customers.

Consistent with existing energy efficiency and conservation programs, "low-income" will be defined as those customers with an income at or below 150% of the Federal Poverty Income Guidelines. Eligibility will be verified by having the customer provide income information when they call or use an online portal to inquire about service or enroll.

Twenty percent of rebates across all categories will be reserved for low-income customers. This percentage is roughly consistent with the percentage of Duquesne Light residential customers identified as low-income.

Q. Will the Company offer any programming to help low-income customers who live in housing provided by a public or non-profit entity to experience the benefits of building electrification?

A. Yes. In addition to the carve out of residential rebates for low-income customers, the Company is proposing a dedicated program for housing providers that serve

low-income customers, with an emphasis on multi-family projects. Residents of low-income housing may be excluded from participation in the other incentive programs, either because they are not the utility account holder and/or because as a tenant they are not able to make physical changes to the property. This program is intended to ensure such customers are provided an opportunity to experience the benefits of building electrification.

Eligible recipients must be a non-profit organization or government entity, such as a local or county housing authority. The Company will be authorized to provide a one-time custom rebate towards new construction or retrofit that enables building electrification, including efficient electric heating, HPWH(s), induction stoves(s), or electric vehicle charging, including any make-ready work required to implement such projects. These custom rebates will assist with the incremental cost difference between the covered appliance types and the traditional alternative, as well as necessary infrastructure changes, to encourage the housing provider to invest in the more efficient version, providing health and safety benefits to the resident.

Rebates will be available to cover up to 30% of project cost, up to a maximum rebate of $50,000. For retrofit heating and cooling projects, the applicant must demonstrate that costs to the low-income resident will not increase as a result of the project.[48]

[48] Note that it may not be feasible to require savings to the individual resident, as tenants may not have responsibility for paying the utility bill.

Q. Are customers participating in building electrification programs eligible for other programs offered by the Company during their enrollment?

A. Yes. Participation in building electrification pilot incentive programs in no way impacts the customer's ability to participate in other utility programs. The program administrator will be trained to direct customers into other programs that may be beneficial to them, based on their individual circumstances (i.e. Act 129, Low-Income Usage Reduction Program, etc.).

Q. **How does the proposed program interact with the existing building electrification rebates available through Act 129 Energy Efficiency and Conservation programs?**

A. Certain technologies supported through the Act 129 Energy Efficiency and Conservation program contribute to building electrification. Specifically, rebates are available for heat pump water heaters and heat pumps for heating and cooling. The building electrification pilot programs proposed herein are separate from but complementary to Act 129 offerings. Because Act 129 is narrowly focused on reducing electricity consumption, it can make it more difficult to incentivize electrification via Act 129. In keeping with the intent of Act 129, these rebates have typically been targeted to the replacement of less efficient electric appliances with a more efficient electric heat pump version, thus reducing electricity consumption. However, in some cases a customer may be replacing a fossil fuel device with an electric heat pump. Additionally, in some cases customers are installing an add-on heat pump to heat and/or cool a previously unconditioned part of the home, such as a third floor or garage, rather than using a less efficient option.

Of note, in 2023, the Company received approval to amend its Phase IV plan to provide a limited number of heat pump rebates to non-commercial customers to cover up to 70% of cost for non-low-income customers and up to 100% for low-income customers. The results of this limited pilot will inform future programming under the Company's Energy Efficiency and Conservation program.

The programs being proposed herein are designed to be complementary to existing Act 129 programming. The Company will use an implementation coordinator to help customers access the programs that are most beneficial to their individual circumstances, including a mix of Act 129 and beneficial electrification rebates.

Of the proposed building electrification rebates, there is only overlap with Act 129 programming for HPWHs, for which Duquesne Light currently offers a $300 rebate for an ENERGY STAR-certified HPWH for both income-qualified and market-rate customers. The Company does not currently offer rebates for induction stoves nor lawn equipment in its existing Act 129 program.

The Company proposes that those customers switching from non-electric water heating to an electric heat pump are eligible to qualify for the building electrification rebate. These applications, while reducing overall energy consumption, will result in an increase in electricity consumption, and thus are inconsistent with Act 129, under the current program rules. For those customers who are switching from an electric water heater to an electric HPWH, we propose that they be eligible for both the Act 129 energy efficiency rebate, as this switch

will reduce kilowatt-hours consumed, and also for the proposed building electrification rebate.

Q. Is the proposed program counter to the state's historic stance on fuel switching?

A. No, this program is centered around a goal of expanding the use of newer, efficient electric technologies where it is beneficial for the customer. The proposed program does not specifically target any one fuel source.

Q. What federal and state incentives exist related to this program?

A. Through the Inflation Reduction Act, the federal government created financial incentives for some activities related to electrification.

- **HPWHs:** For all households, the federal government offers a tax credit up to 30% of the cost of an ENERGY STAR HPWH purchase and installation, up to $2,000. Additionally, moderate- and low-income households can receive a rebate—up to 50% of the cost of a HPWH (up to $1,750) for moderate-income customers and up to 100% of the cost for low-income households (up to $1,750).[49]
- **Induction Stoves:** Rebates for induction stoves are available to cover 100% of costs up to $840 for low-income households, and 50% of costs for moderate income households, up to $840.[50] No incentives exist for non-income qualifying customers.

[49] "Heat Pump Water Heater." Rewiring America. www.rewiringamerica.org/app/ira-calculator/information/heat-pump-water-heater.
[50] "Electric Stove/Induction Stove." Rewiring America. www.rewiringamerica.org/app/ira-calculator/information/electric-stove-induction-stove.

- **Lawn Equipment:** The Inflation Reduction Act includes a tax incentive for commercial lawn equipment, but not for residential scale equipment.
- **Make Ready:** Low-income households can qualify for a rebate up to $4,000 for a new electrical panel and up to $2,500 for wiring upgrades. There is also a tax credit up to 30% of the cost of an electric panel upgrade (up to $600) for all households, if the upgrade is made in conjunction with another eligible upgrade.[51]

Because of the support available for income-qualifying households, the Company has chosen not to provide additional incentives for these customers, but, as mentioned above, has reserved 20% of rebates for low-income customers.

Market rate customers can qualify for a tax credit up to 30% for adoption of HPWHs and for necessary electrical upgrades. A tax credit alone though is not necessarily sufficient to incent a customer to adopt a new technology. Rather, tax credits are likely a bonus for a customer who was already likely to make the transition. The Company believes that tax credits are more likely to be accessed by higher income customers, as well, who have access to upfront capital to make the retrofit and wait until they file the next years taxes to receive the monetary benefit. Additionally, a customer must have sufficient tax liability to be able to benefit.

IRA rebate programs will be implemented through the state and have yet to be established at the time of this filing. Therefore, specific details about the structure, eligibility, and administration of these programs are not yet available.

[51] "Electric Panel Upgrade Tax Credit." Energy Star. www.energystar.gov/about/federal-tax-credits/electric-panel-upgrade.

III. PROGRAM COSTS

Q. What are the costs of the proposed program?

A. The entire portfolio is projected to cost $3,329,000 over the three-year pilot. The table below shows the expected breakout of costs by program area. The Company reserves the right to adjust spending between programs as needed, based on customer uptake.

Building Electrification Pilot Proposals	2025	2026	2027	TOTAL
Awareness, Education, & Engagement (AEE)	$250,000	$200,000	$200,000	$650,000
Workforce Development & Contractor Network	$187,250	$142,250	$147,250	$476,750
Low Income Housing Provider Program	$175,000	$150,000	$150,000	$475,000
Customer Incentives	$223,750	$223,750	$223,750	$671,250
Heat Pump Water Heater	*$37,500*	*$37,500*	*$37,500*	*$112,500*
Induction Cooking	*$25,000*	*$25,000*	*$25,000*	*$75,000*
Lawn Equipment	*$11,250*	*$11,250*	*$11,250*	*$33,750*
Make Ready	*$150,000*	*$150,000*	*$150,000*	*$450,000*
Implementation	$344,500	$352,000	$359,000	$1,056,000
TOTAL BUDGET	**$1,180,500**	**$1,068,000**	**$1,080,000**	**$3,329,000**

A further breakdown of the rebate amounts is as follows:

	Rebate amount		Number of rebates per year	Total amount
Heat Pump Water Heater Rebate	$500		75	$112,500
Induction Stove Rebate	$500		50	$75,000
Lawn equipment Rebate	$75		150	$33,750
Make-ready Pilot for residential electrical upgrades	Panels	$500	200	$300,000
	Circuits	$250	200	$150,000
Total				**$671,250**

The Company will retain the right to change incentive amounts based on customer behavior, response rate, and market conditions to further test the impact of the incentive value on customer behavior.

Q. What are the proposed bill impacts of these programs?

A. The Company estimates that these proposed activities would add approximately $0.15 or 0.11% to the monthly bills of a typical residential customer; and $0.30, or 0.02% to the monthly bills of a typical nonresidential customer on rate GM.

Q. How is Duquesne Light proposing to recover the costs associated with the proposed building electrification programs?

A. The Company proposes to recover program costs as an expense through base rates, as described in Statement No. 13.

Q. What additional staffing or resources are needed to deliver the program?

A. The Company anticipates that two additional full-time employees will be required to develop and manage the pilot programs. Additionally, an implementation contractor will be secured to administer program delivery. If practicable, the Company may utilize the same contractor that currently administers energy efficiency programs. Doing so is likely to result in cost efficiency. Additionally, because the contractor has familiarity with other programs, they can more effectively facilitate the customer's participation in more than one program for which they qualify.

The Company may also utilize external resources as part of its AEE program. To the extent possible, it will seek to achieve synergies with the Transportation Electrification and Energy Efficiency programs.

Q. Do you believe that the proposed building electrification programs are cost-effective and reasonable?

A. Yes, the Company believes that the proposed programs provide a benefit to customers that outweighs the cost. As a pilot, the program is designed to have a minimal impact on residential customer bills while providing widespread education, with a particular focus on securing the benefits of IRA funding for Duquesne Light Customers. Further, the learnings developed through this program will support future Duquesne Light planning and programs.

Q. Why should Duquesne Light as a regulated utility provide these programs?

A. As described above, increasing numbers of consumers are choosing electric options, for efficiency, performance, cost-savings, and/or environmental and health benefits. Electric distribution companies like Duquesne Light must be prepared for these changing customer preferences and usage patterns, to ensure the grid remains a reliable, safe, and affordable resource for all customers. Beneficial electrification technologies may also begin to serve as grid assets in the future. For example, electric water heaters, including HPWHs, can be leveraged by demand management programs. By beginning to offer these pilot programs, Duquesne Light will have an opportunity to proactively evolve its systems and services gradually as needed, rather than being in a position where it must react to unexpected impacts.

Additionally, and importantly, Duquesne Light has an obligation and privilege to serve *all* customers, which allows an opportunity to share the benefits of electrification to audiences that may not otherwise be engaged. This is especially

important in light of the incentives available through the federal and state government for electrification and associated clean energy activities. Duquesne Light has a desire to enable its customers to access these programs to the greatest extent possible.

Finally, as the utility provider, Duquesne Light is positioned to facilitate regional partnerships to drive results. It does not seek to duplicate the efforts of other organizations, but rather to coordinate and add capacity to allow more Duquesne Light customers to experience the benefits of electrification.

While the Company has identified Awareness, Education, and Engagement, along with workforce and contractor development, as the most impactful areas of this portfolio, it believes an associated incentive program is critical to success. In common parlance, the rebate is "the hook" that draws in customers, contractors, and partner organizations. In reviewing programs from utilities across the country, all included at least some rebate offering for this reason.

Q. What are the benefits to all Duquesne Light customers that will result from these pilot programs?

A. All Duquesne Light customers will benefit from reduced air emissions and climate impacts related to decarbonization. All customers are impacted by changing weather patterns, consistent with global climate change. Storm impacts have increased over the past two decades, as noted in the PUC's most recent Electric Reliability Report.[52] This pattern is expected to continue. Storms and high winds have obvious impacts on electrical infrastructure. Predicted increases in heavy

[52] Pennsylvania Electric Reliability Report 2021 (August 2022). www.puc.pa.gov/media/2053/2021-electric-reliability-report_final.pdf

precipitation events also impact the grid, via flooding, landslides, and saturated soils that can result in healthy trees being uprooted and falling into lines. Additionally, the number of extreme heat days is expected to increase. High temperatures are a stressor for electrical infrastructure. Pennsylvania's 2021 Climate Impacts Assessment Report predicts that there will be 37 days per year by mid-century in which highs are over 90ºF, compared to five days per year from 1971 to 2000.[53] All customers bear the costs of storm response, as well as the impacts of flooding and extreme temperatures.

Additionally, electrification can lead to greater system utilization, reducing the cost of distribution service per kilowatt-hour paid by all customers. It is more beneficial to all customers to have a more gradual energy transition, in which the Company is an active participant, rather than a future in which the utility must make rapid investment to "catch up." The size of the proposed portfolio is intentionally modest, to minimize bill impacts to customers while allowing the Company an opportunity to gather important information to inform future grid planning and utility offerings.

CONCLUSION

Q. What are the metrics by which you plan to measure success and how will those be shared with interested stakeholders?

[53] Pennsylvania Climate Impacts Assessment 2021 (January 2021) https://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/Climate%20Change%20Advisory%20Committee/2021/2-23-21/2021_Impacts_Assessment_Final_2-09-21_clean.pdf

A. The Company plans to assess the programs by a number of factors including the following:

- Periodic surveys and other market research to assess customer awareness and attitudes towards electrification;
- Number of rebates provided by project type;
- Estimated energy savings resulting from the program;
- Estimated air pollution emissions reductions resulting from the program;
- Metrics on outreach activities, such as number of participants in events, website visitors, etc.; and
- Number of workforce trainings supported, along with attendance numbers.

The Company anticipates sharing these metrics via an annual report to be filed with the Commission and shared with intervenors and other interested stakeholders. A draft evaluation plan is included as Exhibit LB-1.

Q. Does this conclude your Direct Testimony at this time?

A. Yes. I reserve the right to supplement my testimony through the course of this proceeding.

Building Electrification Portfolio Evaluation and Assessment Plan

Dated: March 8, 2024

Contents

Introduction

Duquesne Light Company (the "Company") hereby submits this Building Electrification (BE) Portfolio Evaluation and Assessment Plan ("Evaluation Plan") as an Exhibit to Duquesne Light Company Statement No. 5, Direct Testimony of Lindsay Baxter, at Docket No. R-2024-3046523. The Evaluation Plan was largely modeled after the Company's Transportation Electrification Portfolio Evaluation and Assessment Plan, which was agreed to in the *Joint Petition for Approval of Settlement Stipulation* ("Settlement"), approved by the Pennsylvania Public Utility Commission by Order entered December 16, 2021, at Docket No. R-2021-3024750.

Evaluation and Assessment Overview

The Evaluation Report will use the following structure: executive summary, BE Portfolio summary and goals, initiative-by-initiative evaluation methodology and results, and conclusion.

The Executive Summary will detail major BE portfolio successes, challenges, key findings, and opportunities for improvement.

This section will be followed by a high-level summary of the BE Portfolio and the overarching goals of the Company's work.

Next, the Company will detail an initiative-by-initiative evaluation of the three major BE portfolio components: Awareness, Education, and Engagement; Workforce Development and Contractor Network; and Customer Incentives. For each initiative, the Company will provide an overview of the initiative, outline the initiative's objectives, and detail the initiative's evaluation methodology and evaluation results, including key findings.

Finally, the report will include a conclusion and identify key recommendations.

The Company may adjust initiative implementation as it evaluates program performance, which will be discussed in the Evaluation Report.

Data Sources and Methodology

To develop its Evaluation Report, the Company will use a variety of data sources, such as program delivery metrics, website analytics, and customer surveys. Relying on a variety of data sources will enable the Company to assess initiative results, but also to assess the program design and process which produced the results.

Customer surveys and interviews

To assist with the evaluation, the Company will survey its customers, including residential customers to understand their views about building electrification and to understand how they have utilized Company provided resources. The Company will also survey customers who participated in its BE incentive programs to glean additional qualitative insights about the program processes and impacts.

Program materials, data, and tracking systems

The Company will share and evaluate the program materials it produced to educate customers and disseminate information about its offerings. Additionally, the Company will use information from its internal tracking systems to help inform analysis, such as project costs and timelines for key milestones. The Company will also leverage data from platforms like Google Analytics to report on website and program resources usage.

Evaluation Approaches

Below, the Company describes in detail its evaluation approach for each BE initiative, including a summary of the initiative, key objectives, contents of the evaluation, and key progress indicators (KPIs), targets, and data sources.

Awareness, Education and Engagement Initiative

Initiative Summary

Through its Awareness, Education, and Engagement (AEE) initiative, the Company aims to increase customer awareness of building electrification and enable the beneficial electrification of end uses. The Company will provide online educational resources for customers and will hold and attend in-person and virtual events to educate customers about building electrification approaches and technologies. The Company will also inform customers about available federal, state, and Company BE incentive programs and enable their access to these programs.

Although a range of factors will ultimately guide a customer's decision-making about purchasing a new electric appliance, such as an induction stove or heat pump water heater, the Company aims to be a trusted source for high-quality information that can help customers in that process.

Due to the often-difficult nature of assessing the direct impact of AEE activities, the Company will rely on surveys of customer attitudes about building electrification, along with feedback on Company resources when possible.

Key Objectives

- Increase customer awareness of BE technologies.
- Increase customer likelihood of BE technology adoption.
- Increase customer awareness of publicly available incentives for BE, including federal, state, and DLC utility incentives.

- Be viewed as a trusted partner for our customers seeking information about BE.
- Identify barriers that impede BE adoption among customers.

Evaluation Components

- Provide a description of AEE activities undertaken, including the target audience, channel, and results by year.
- Provide a budget breakdown by major categories by year.
- Provide a description of activities that were targeted toward low-income customers by year.
- Summarize annual customer BE survey results, including customer familiarity with devices such as heat pumps, heat pump hot water heaters and induction stoves, likelihood of adoption, and adoption concerns.
- Describe key takeaways from customer feedback on Company-provided resources and events.

KPIs, Targets and Data Sources

In addition to the evaluation components described above, the Company has established and will report on the metrics and targets below.

KPI	2025 Target	2026 Target	2027 Target	Measurement/ Data Source
Customer familiarity with BE	35%	38%	41%	Annual BE Customer Survey (Customer Panel)
Customer familiarity with HPWH	28%	31%	34%	Annual BE Customer Survey (Customer Panel)
Customer likelihood to adopt HPWH	10%	13%	16%	Annual BE Customer Survey (Customer Panel)
Customer familiarity with induction stove	30%	33%	37%	Annual BE Customer Survey (Customer Panel)
Customer likelihood to adopt induction stove	17%	20%	23%	Annual BE Customer Survey (Customer Panel)
Customer familiarity with electric lawn mower	70%	73%	76%	Annual BE Customer Survey (Customer Panel)
Customer likelihood to adopt electric lawn mower	35%	38%	41%	Annual BE Customer Survey (Customer Panel)
Customer familiarity with heat pumps	35%	38%	41%	Annual BE Customer Survey (Customer Panel)

Customer likelihood to adopt heat pumps	12%	15%	18%	Annual BE Customer Survey (Customer Panel)
Events Held (virtual and in-person)	4	6	6	Event summaries
BE Website Annual Views	28,000	30,000	32,000	Google analytics
BE Website Annual Unique Views	10,000	12,000	14,000	Google analytics

Workforce Development and Contractor Network

Initiative Summary

As demand for building electrification continues to grow, a highly skilled and experienced workforce will be needed. The Workforce Development and Contractor Network program will focus on leveraging the Company's existing relationships with workforce partners (such as Partner4Work, Pittsburgh Gateways, A. Philip Randolph Institute, and the Pennsylvania College of Technology) and draw upon available resources and trainings from equipment manufacturers to facilitate the development of the building electrification workforce in the Pittsburgh region. Additionally, the Company plans to build a network of installation contractors and other relevant building service professionals to partner in advancing Company offered programs, as well as complementary federal or state programs. Providing information on programs to contractors helps them to provide more value to their customers and helps customers to adopt clean energy solutions.

Key Objectives

- Understand existing and projected workforce needs related to delivering building electrification solutions.
- Together with local and regional workforce partners, build a network focused on cultivating and growing the building electrification workforce in the Pittsburgh region.
- Support upskilling existing workforce and growing the future workforce for building electrification by sponsoring trainings and sharing existing resources.
- Educate installation professionals about available DLC incentives related to building electrification, as well as state and federal incentives, who in turn will inform customers.

Evaluation Components

For the process evaluation, the Company will include the following evaluation components:

- Describe how the Company engaged local, regional, and national workforce partners to develop a network focused on growing the building electrification workforce in the Pittsburgh region.
- Report the number of building electrification industry trainings supported by DLC.

- Report the number of individual installation professionals who participated in building electrification trainings supported by DLC. This report aims to capture both existing professionals participating in "upskilling" and new students learning a new trade.

KPIs, Targets and Data Sources

In addition to the evaluation components described above, the Company has established and will report on the below KPIs and targets.

KPI	2025 Target	2026 Target	2027 Target	Measurement/ Data Source
Number of workforce partners engaged	4	6	8	
Number of industry trainings supported by DLC	5	7	10	
Number of individuals participating in BE trainings (existing professionals/ new students)	100	150	200	

Customer Incentives for BE

The Company aims to reduce the upfront cost barrier to adopting beneficial electrification technologies for residential customers who wish to electrify end uses in their homes and experience the associated benefits. The Company's pilot incentive program will support customers adopting heat pump water heaters; electric induction stoves; electric lawn equipment; and wiring and panel upgrades associated with installing beneficial electrification technologies ("make-ready" incentive).

Objectives

- Increase adoption of BE technologies/facilitate the adoption of BE technologies ("make-ready") by reducing the upfront costs of adoption for participating customers.
- Reduce local air pollution and greenhouse gas emissions.
- Improve energy efficiency within residential homes.
- Inform customers about additional incentives that customers can access, including federal, state, and DLC programs.
- Better understand customer barriers to installing BE technologies, including within low-income single-family and multi-family residences.
- Better understand how home electrification impacts grid operations.

- Use BE installation locational data to help inform grid planning.

Evaluation Components

For the process evaluation, the Company will include the following evaluation components:

- Report the annual number of incentives claimed for each qualifying BE technology, including by income range/CAP participation based on voluntary customer responses.
- Report the number of federal and state incentives received by customer participants, based on voluntary customer responses.
- Report aggregated information about incentive recipients, including geographic area, and zip code.
- Describe how BE incentives enabled the Company to understand barriers to adoption, including in low-income single-family and multi-family residences.
- Describe how BE incentive data helped to inform the Company's grid operations and grid planning efforts.

For the impact evaluation, the Company will include the following evaluation components:

- Estimate the energy savings associated with BE technologies deployed via incentives (in BTU or kWh)
- Estimate the greenhouse gas emissions savings associated with BE technologies deployed via incentives (in metric tons)
- Estimate the air quality emissions benefits associated with BE technologies deployed via incentives (in metric tons)

KPIs, Targets and Data Sources

In addition to the evaluation components described above, the Company has established and will report on the KPIs and targets below.

KPIs	2025 Target	2026 Target	2027 Target	Measurement/ Data Source
Number of heat pump water heater rebates issued	75	75	75	Rebate applications from implementation contractor
Number of induction stove rebates issued	50	50	50	Rebate applications from implementation contractor
Number of electric lawn equipment rebates issued	150	150	150	Rebate applications from implementation contractor

Number of make-ready rebates issued, reported by type (circuit rewire, panel upgrade)	400	400	400	Rebate applications from implementation contractor

Conclusion:

Duquesne Light will share the evaluation report with interested parties annually. It will include a qualitative discussion of lessons learned and any recommendations for future programming.

DLC 98 BE Programs

August 2023

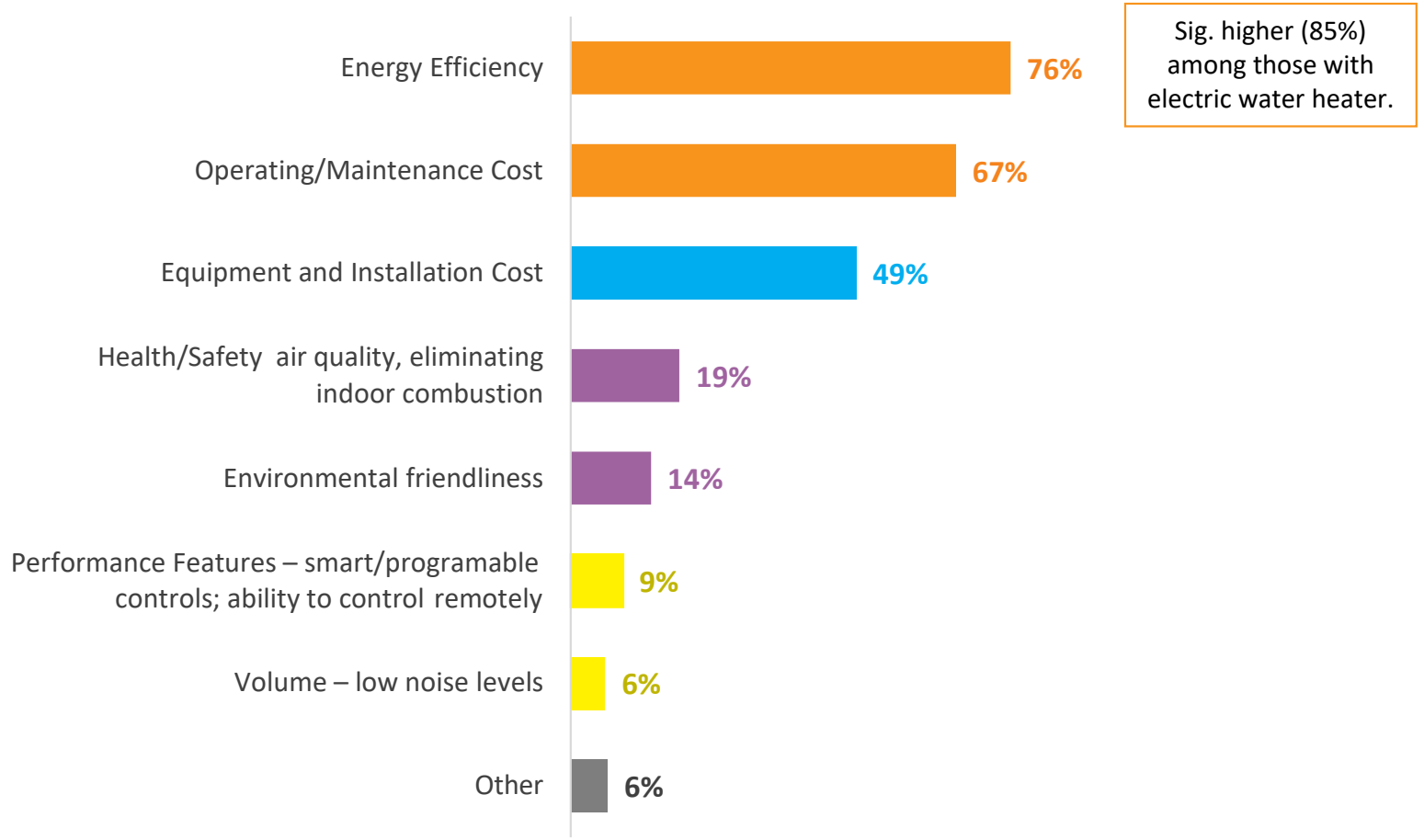
Customer Perceptions

Respondents select energy efficiency and monthly operating costs to be the most important factors when considering the next water heater for their residence.

3

Most Important Factors When Considering Water Heater

responses accepted



Q2: When deciding on the next **hot water heater** for your residence, what factors are of **most** importance to you? Please select up to three factors. n=825

A high majority of respondents use natural gas to heat their water. About one in four customers is familiar with heat pump hot water heaters and just one in ten is likely to consider installing one.

Familiarity with Heat Pump Hot Water Heaters

% Own or Familiar

28%

Currently own | Very familiar | Somewhat familiar | Not very familiar | Not at all familiar

Likelihood is sig. higher among **customers who own or are familiar** with heat pump water heaters.

Likelihood to Consider Heat Pump Hot Water Heater

% Likely

10%

Extremely likely | Very likely | Somewhat likely | Somewhat unlikely | Extremely unlikely

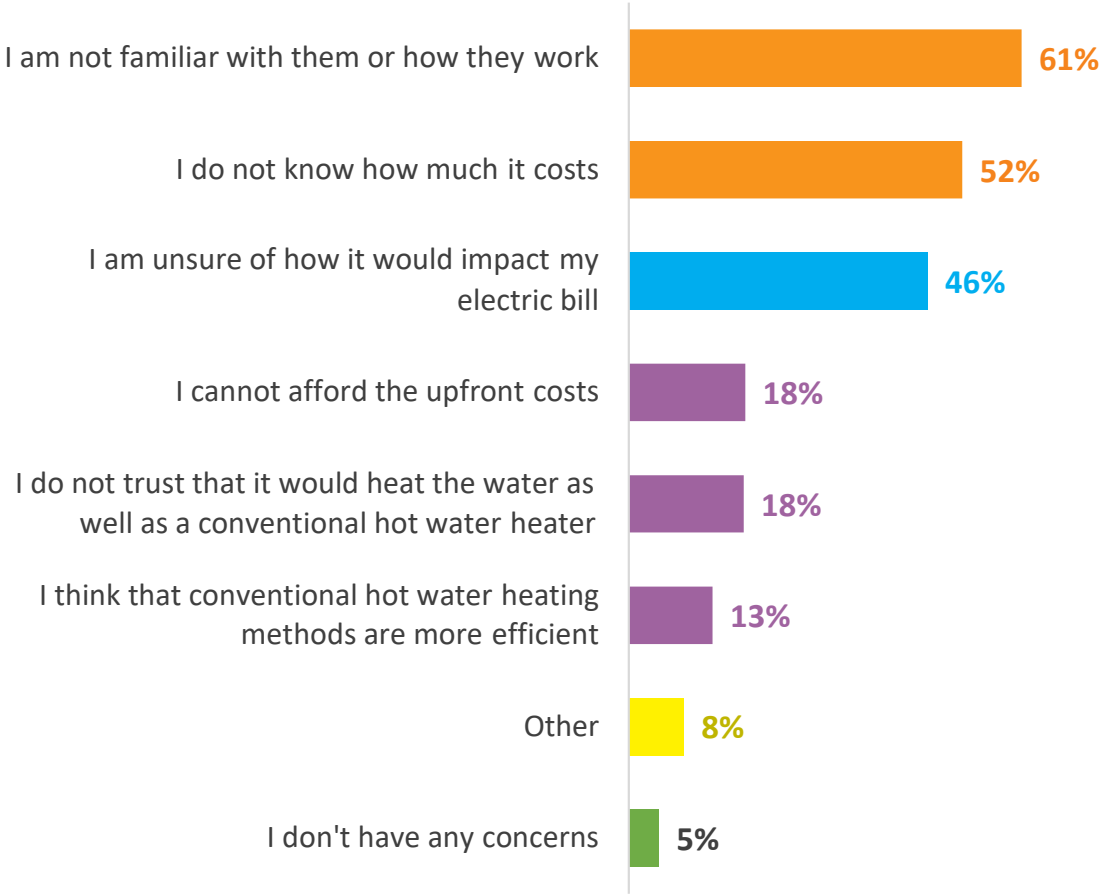
Likelihood is sig. higher (15%) among those with **electric water heater** and those that select **environmental friendliness** (23%) and **health and safety** (15%) as important factors.

Q2a_2: How familiar are you with Heat Pump Hot Water Heaters and how they can be used to heat the water at your home? n=825

Q2b: If you had a need to replace your current hot water heating system, how likely are you to consider installing a heat pump hot water heater at your residence? n=825

Top concerns with heat pumps include little familiarity with them and how they work and uncertainty with the upfront cost and impact on their electric bill.

Concerns with Heat Pump Hot Water Heaters

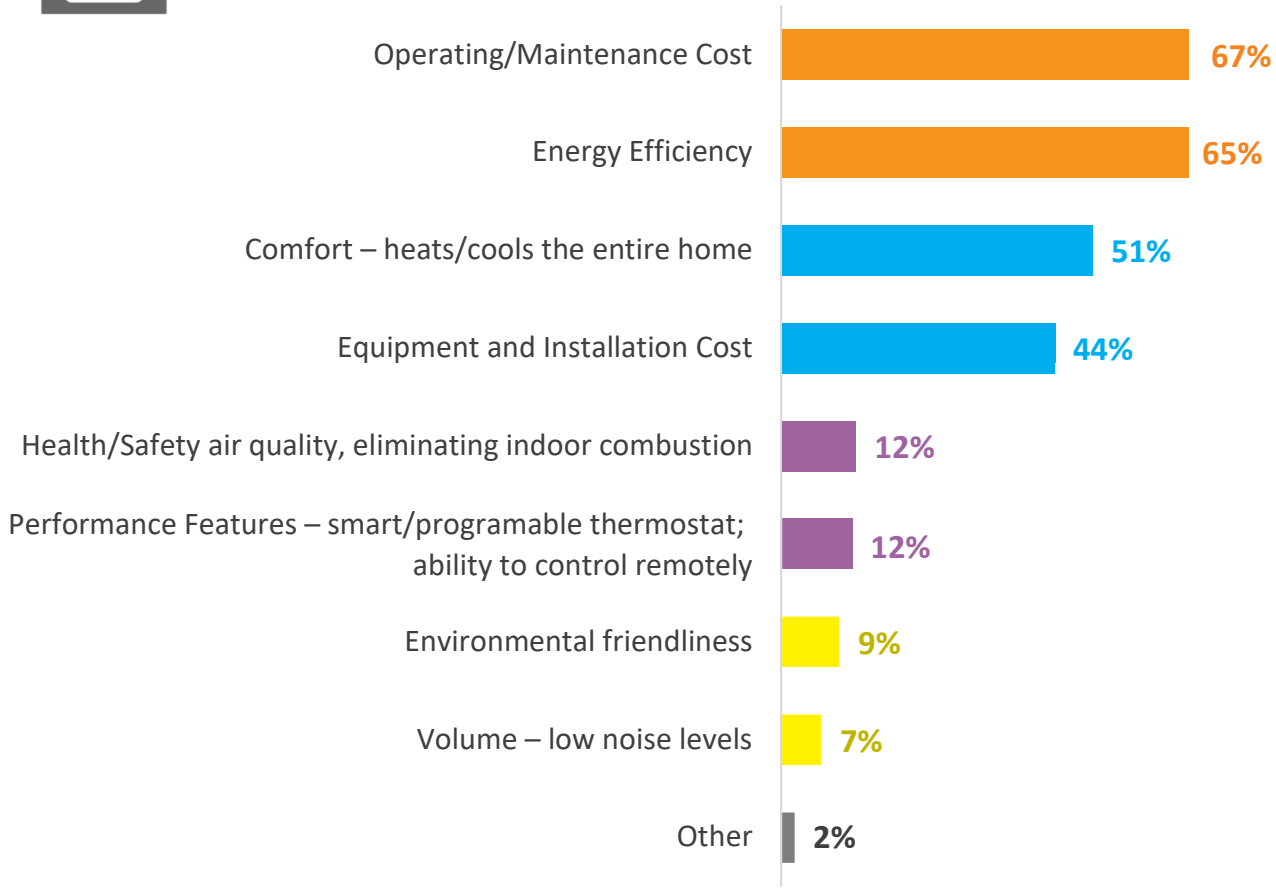


Q2c: What challenges or concerns do you have regarding Heat Pump Hot Water Heaters versus traditional hot water heaters? n=825

Top factors when considering a water heater include operating/maintenance costs and energy efficiency with two out of three respondents having interest in these factors.

Most Important Factors When Considering Heating/Cooling System

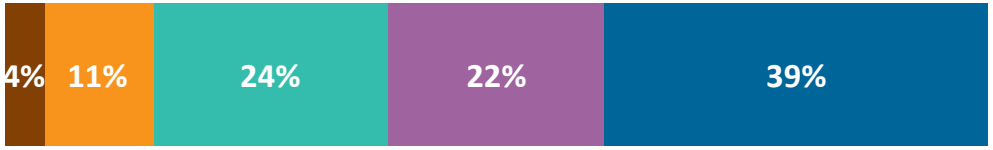
3 responses accepted



Q3: Now please think about home heating/cooling systems. When deciding on the next heating/cooling system for your residence, what factors are of most importance to you? n=825

About four in ten respondents are familiar with heat pumps for heating and cooling though just one in ten would consider one for their heating and cooling system in the future.

Familiarity with Heat Pumps for Heating & Cooling System



% Own or Familiar

39%

Currently Own | Very familiar | Somewhat familiar | Not very familiar | Not at all familiar

Likelihood is sig. higher among **customers who own or are familiar** with heat pump for heating and cooling.

Likelihood to Consider Heat Pump for Home Heating & Cooling System

% Likely

12%

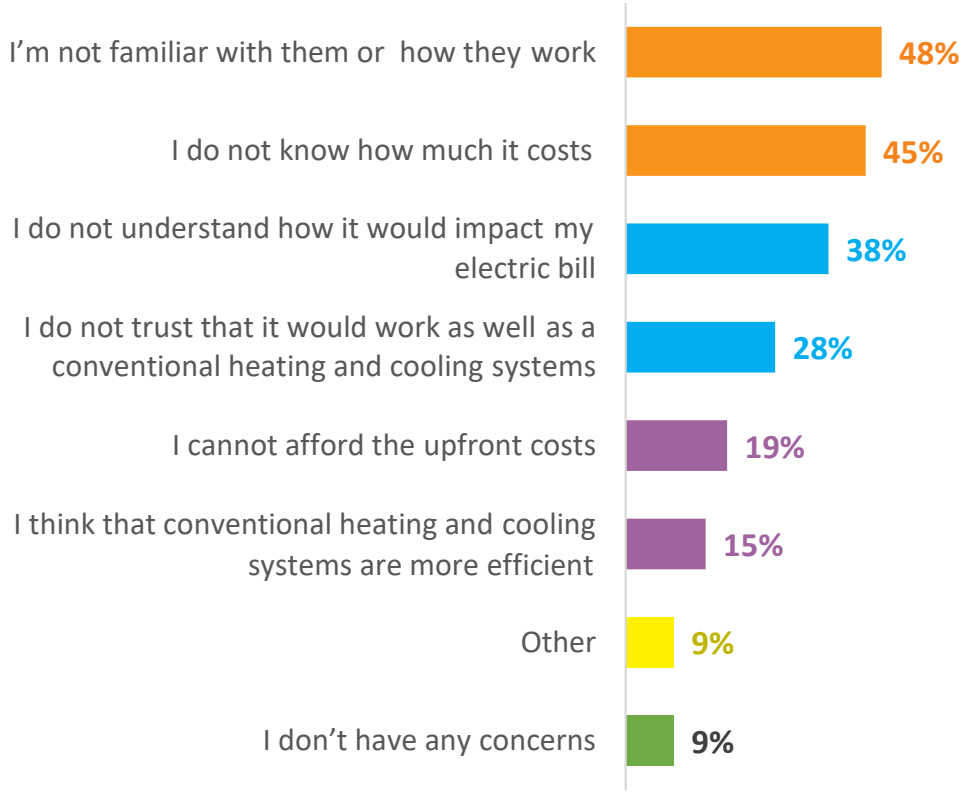
Extremely likely | Very likely | Somewhat likely | Somewhat unlikely | Extremely unlikely

Sig. higher (29%) among customers who consider **environmental friendliness** to be most important when selecting next heating/cooling system.

Q3a_2: How familiar are you with Heat Pumps and how they can be used to heat and cool your home? n=825
Q3c: If you had a need to replace your current **home heating and cooling system**, how likely are you to consider installing a **heat pump** at your residence? n=825

Top customer concerns with Heat Pumps include being unfamiliar with how they work and uncertainty surrounding costs.

Concerns with Heat Pump vs. Traditional Heating & Cooling Systems



Q3d: What challenges or concerns do you have regarding heat pumps versus traditional heating and cooling systems? n=825