ULI Philadelphia

RETROFITTING AFFORDABLE HOUSING FOR NET ZERO

Philadelphia, Pennsylvania

Workshop | May 8-9, 2025

About the Partners

Urban Land Institute

The Urban Land Institute (ULI) was established in 1936 as a nonprofit educational and research institute. It is supported by more than 45,000 members in 82 countries representing all aspects of land use and development disciplines. ULI's mission is to shape the future of the built environment for transformative impact in communities worldwide. ULI Philadelphia has nearly 900 members in the Philadelphia District Council, which includes the Philadelphia metropolitan area, Central Pennsylvania, the Lehigh Valley, Southern New Jersey and Delaware.

ULI provides guidance to nonprofits and municipalities seeking solutions to land use challenges. Its Technical Assistance Panels objectively evaluate specific needs and make recommendations on implementation in an atmosphere free of politics and preconceptions. ULI member and non-member professionals provide their expertise in a voluntary capacity and each has signed an agreement to prevent current and potential conflicts of interest.

ULI Randall Lewis Center for Sustainability in Real Estate

The ULI Randall Lewis Center for Sustainability in Real Estate (the Center) leads the real estate industry in creating places and buildings where people and the environment thrive. In collaboration with ULI members and partners, the Lewis Center drives industry transformation, cultivates leaders and champions, and helps foster solutions for sustainable, resilient, healthy and equitable cities and communities. The Center pursues these goals via cutting-edge research, global convenings, community technical assistance, and other strategies. The Center's main programs are Decarbonization, Urban Resilience, and Healthy Places.

The Net Zero Imperative

Thanks to a generous gift from Owen Thomas, ULI has launched the Net Zero Imperative—a multi-year initiative to accelerate decarbonization in the built environment. Additional gifts from Lynn Thurber, Joe Azrack, Franz Colloredo-Mansfeld, and Dan Cashdan further support and bolster the NZI program's scale and impact. Work to advance the initiative includes technical assistance panels in five global cities each year, designed to help developers, building owners, cities, and other relevant constituents reduce carbon emissions associated with buildings, communities, and cities.

The fundamental goal of the effort is to provide concrete ideas and strategies to real estate owners, public sector leaders, and the general public to eliminate carbon emissions from the built environment to reach net zero. Through its work, the initiative will create global resources (research, toolkits, and other tools) to help all ULI members accelerate decarbonization in their real estate operations and in their cities.

Cover photo: The workshop participants toured several housing developments that are incorporating decarbonization measures. (ULI)

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City of Philadelphia Division of Housing and Community Development

As part of the Department of Planning and Development, the Division of Housing and Community Development (DHCD) funds programs that support:

- Homes for people at all income levels
- Commercial corridors with thriving businesses
- Healthy neighborhoods

The programs DHCD supports help people buy their first homes or repair the one they are in. These programs save families from foreclosure and eviction. They help homeless people with HIV/AIDS find permanent housing and people with disabilities live more independently. These programs support small businesses and tend to Philadelphia's vacant lots.

DHCD funding helps developers build new affordable homes and preserve existing ones. Those projects also create jobs in neighborhoods across the city. The funding helps create better designed neighborhoods with engaged residents.

Philadelphia Housing Development Corporation

Philadelphia Housing Development Corporation (PHDC) is Philadelphia's full-service community development organization. PHDC repairs homes and finances affordable housing. It also helps communities plan and helps residents, community groups, businesses and developers repurpose vacant land. And PHDC supports amenities that make neighborhoods great places to live. Supported by dedicated staff, PHDC works in every neighborhood in Philadelphia.

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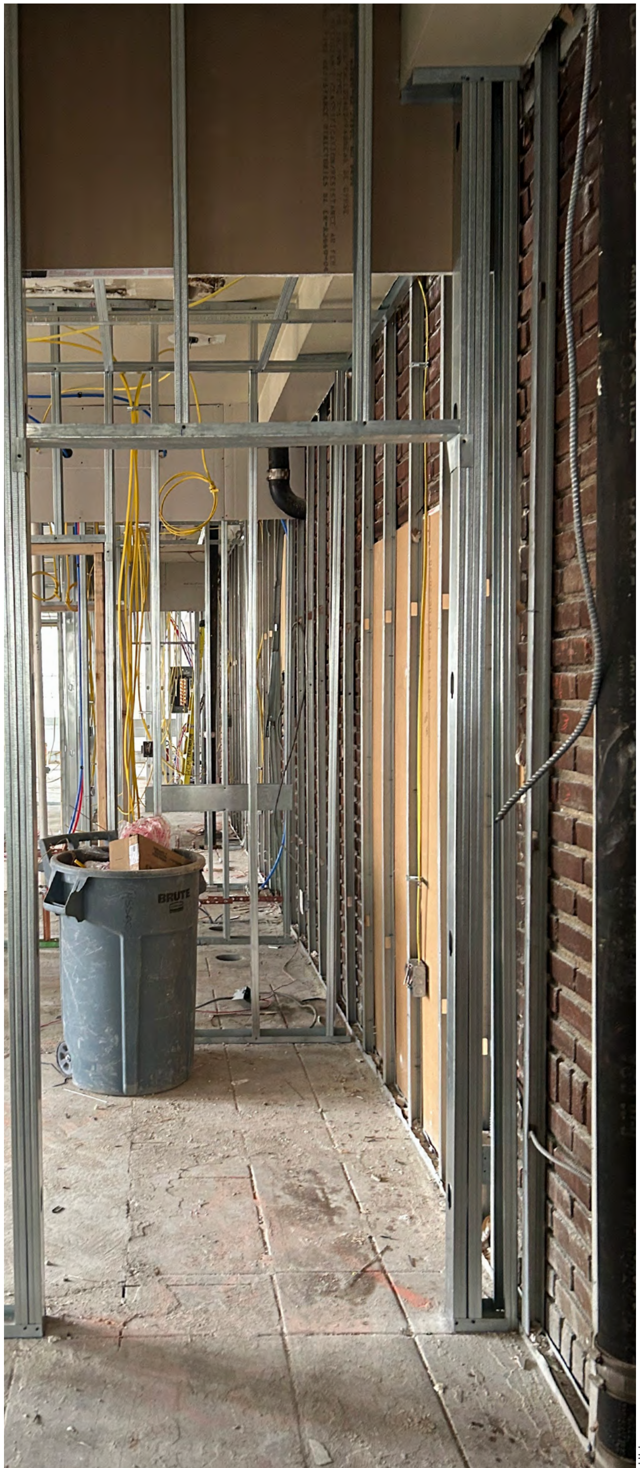

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Introduction and Workshop Scope

The real estate industry is at a critical point to decarbonize. Ultimately, the goal will be to reach net zero, but it can be difficult to know where to start or how to push forward. The Urban Land Institute's Net Zero Imperative is a global multi-year initiative to accelerate decarbonization in the built environment and is working with a collaborative network of ULI District and National Councils, including local governments, real estate leaders, ULI local staff, and community stakeholder groups focused on decarbonizing cities and real estate.

To support efforts to reduce carbon in the built environment in Philadelphia, ULI Philadelphia partnered with the City of Philadelphia's (the City) Division of Housing and Community Development (DHCD) and Philadelphia Housing Development Corporation (PHDC) to host a two-day technical assistance workshop focused on best practices and lessons learned in retrofitting existing affordable housing developments to preserve their affordability and become carbon neutral.

The primary goal of the workshop was to create a blueprint for DHCD, PHDC, and others in the affordable housing sector to successfully retrofit projects to achieve carbon neutrality while maintaining affordability. Workshop partners assembled a team of practitioners from across the country to present a range of case studies, facilitate conversations, and tour affordable housing developments, sharing best practices and lessons learned in retrofitting existing affordable multi-family housing stock nearing the end of subsidy terms to preserve affordability and become carbon neutral. The workshop also included administrators from peer cities who have faced and overcome similar challenges in managing their affordable housing portfolios and who have structured local financing products to leverage other funds to support residential decarbonization.

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> Buildings and Industry are the largest contributor to Philadelphia's carbon footprint.
>
> *–Nidhi Krishen*
> *Deputy Director for Climate Solutions, City of Philadelphia Office of Sustainability*

Workshop Scope

Workshop participants were presented with the following questions to consider throughout the engagement.

How might the City complement gap financing for full rehab projects with options for smaller more gradual interventions?

- What are the different rehab and decarbonization models and when and where do they work best?
- Where would smaller and/or larger financing options make sense in a building's lifecycle?
- What types of public financing have worked well elsewhere for achieving affordability and decarbonization goals? What were the characteristics that made them successful?

What training or other support would enable owners of affordable multifamily properties to successfully plan for and implement preservation and decarbonization projects effectively?

- What types of entities provide this support in peer cities?

How does the regulatory environment in peer jurisdictions affect the preservation of affordable housing (both affordability and decarbonization)?

- What elements of that regulatory environment exist (or do not) in Philly?
- How might the City and external partners prepare for possible regulatory changes in the future (building performance standards, proactive code enforcement, and expanded Right of First Refusal)?

Desired Outputs

In addition to these questions, DHCD and PHDC also asked participants to consider the following desired outputs.

1. **Recommendations for structure and offerings of related new initiatives for funding rehabs, and recommended changes to existing financing offerings, including:**
    a. Recommendations for future preservation RFPs.
    b. Considerations for a planned analysis of building condition and funding needs
2. **Capacity building recommendations to help shape staff support for affordable housing developers within the Department of Planning and Development**
3. **List of key supportive regulations for the Administration and Council to consider**

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Workshop participants included both local practitioners and professionals from across the country.

With these items serving as guideposts throughout the workshop, participants toured affordable housing developments, heard from local private and public sector housing leadership, and learned from peer presenters who shared information on programs and practices at work in their respective communities.

Philadelphia's Housing Context

"Philadelphia's building stock is overwhelmingly old, small, and residential." This statement, from a workshop presenter set the stage for the two-day deep dive into Philadelphia's affordable housing context and the challenges developers and leaders face in maintaining affordability while moving toward decarbonization.

- Philadelphia's housing is some of the oldest in the country. Nearly 40% of current housing supply was built in 1939 or earlier and 25% was built between 1940 to 1959.
- The median household income is $56,517 (the national average is approximately $77,500).
- White, non-Hispanic households in Philadelphia earn nearly $40,000 more per year, on average, than Black or Hispanic households.
- Although the city's poverty rate has declined it remains high at 21.7%.
- Philadelphia has long been known as a city of homeowners, but the renter population is increasing and is nearly the same size as homeowner population.
- Approximately 152,854 (49%) Philadelphia renters and 90,860 (26%) homeowners are cost burdened. The increased risks created by data centers' energy consumption will raise costs across the system for every user, including residents of multifamily buildings.

Philadelphia is one of the most energy-burdened cities in the United States with the median energy burden tracked at 86% higher than the national average. Many households living in rental units lack the agency to make energy efficient improvements, leaving them

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> Pennsylvania's regional grid is moving away from coal-powered energy generation and shifting to natural gas.
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> At the time of this workshop, renewable sources made up only four percent of the power generation in Pennsylvania.
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> *–Nidhi Krishen*
> *Deputy Director for Climate Solutions, City of Philadelphia Office of Sustainability*

responsible for the bulk of the unit's utility costs without the ability to pursue solutions. In other instances, tenants can make improvements and then be reimbursed by utility companies, but landlords must sign off on the improvements, and many are unwilling to do so or make it prohibitively difficult for the tenant to get the approval.

The challenge of retrofitting Philadelphia's single-family housing units as well as units in larger multifamily buildings is significant, yet with a new mayoral administration focused on housing, it is an opportune time for the City and its partners to chart an actionable path forward.

City Support for Affordable Housing Preservation

In a city where 88 percent of the housing stock was built before 1980, DHCD has a particular focus on preservation efforts and affordable housing preservation in particular.

Through these preservation efforts, DHCD strives to lessen households' housing and energy cost burdens, reduce the risk of residential displacement, and facilitate Philadelphians' greater access to quality housing options.

Mark Dodds, Deputy Director of DHCD, outlined the City of Philadelphia's affordable housing preservation programs and resources. Key initiatives include:

- **Gap financing for preservation.** The City has a long-standing program for delivering funding for rental housing production and preservation to private, non-profit and CDC developers through a competitive RFP process. The program has helped create a diverse stock of affordable housing at various ages and scales, even allowing for the adaptive reuse of churches, warehouses, and historic landmarks as affordable housing. In the late 20th / early 21st century, funding was primarily directed toward property acquisition and new construction; in recent years, the City has allocated more funding for preservation, acknowledging the need for

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Mark Dodds, Deputy Director, DHCD, shared information regarding Philadelphia's existing affordable housing financing programs and partnerships.

property rehabilitation after the wave of construction 20-30 years ago.

- **Housing Opportunities Made Easy "H.O.M.E." Initiative.** This initiative is focused on supporting the development and preservation of 30,000 units of affordable housing in the city, primarily through streamlining the development process. The effort will be supported by an $800 million bond to be raised over four years.
- **Affordable Housing Developer Services.** Through the course of work related to Philadelphia Mayor Cherelle Parker's executive order establishing the H.O.M.E. Initiative, the Department of Planning and Development (DPD) interviewed all agencies that touch housing to identify potential efficiency and collaborative opportunities. This effort confirmed an emerging idea in the Department: that there is a need to create resources and technical assistance opportunities to guide developers through every stage of development, from financing and tax credits, to permitting and zoning paperwork, to post-construction compliance.
- **Preservation Network.** Working with Local Initiatives Support Corporation (LISC), DHCD has established a network of partners who meet regularly to address affordable housing preservation. The Network is an important forum for stakeholders to share information and develop preservation strategies.
- **Affordable Housing Directory and Right of First Refusal (ROFR).** In accordance with legislation passed by City Council in 2023, DHCD has developed a map that depicts where affordable projects are located and notes affordability term expiration dates. Additional market value and displacement risk layers on the map highlight vulnerable buildings that may be moving from affordable to market-rate when LIHTC terms expire. In addition, ROFR allows non-profit developers, tenant groups, and others the first opportunity to purchase properties before restrictions expire, ensuring that they remain affordable.

These initiatives complement and build on each other, providing a strong framework for further growth and innovation.

Kate's Place, in Philadelphia's Center City, provides permanent supportive housing residence for adults who have experienced homelessness or are at risk of homelessness.

Regulations Supportive of Decarbonization

While a number of developers and building owners have recognized the value of decarbonizing their buildings in support of utility savings and other cost and environmental benefits, many more will require encouragement. Local regulations can help with this encouragement and provide building owners and developers with a path forward.

In many cases, building decarbonization begins with a move toward electrification and away from using natural gas in the building and in individual units. For Philadelphia, the move toward electrification is complicated by the City's ownership of the natural gas utility (PGW) and its ability to sell natural gas at a much cheaper rate than electricity. In this case, electrification and gas reduction must be addressed in parallel so that Philadelphia is moving toward renewable energy while not creating greater energy cost burdens for residents. While City leaders address this macro utility challenge, measures taken at the building and unit level, including weatherization, moving away from heating oil, and resistance electric heating can reduce a household's energy consumption and better prepare the community for a broader shift away from fossil fuels.

In 2012, the City of Philadelphia began energy benchmarking for buildings over 50,000 square feet. In 2019, the City added a performance policy for 50,000 square feet or larger commercial buildings. Workshop presenters provided the following insights into additional measures and regulations that can be enacted at the city level to reduce building energy consumption.

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> Our regulatory context in NYC has changed what is possible in the market.
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> *–Laura S. Humphrey*
> *Senior Director of Energy & Sustainability*
> *L+M Development Partners*
> *New York City, NY*

BERDO, Boston

Building Emissions Reductions and Disclosure Ordinance (BERDO). The City of Boston has enacted BERDO to promote efforts to reduce carbon emissions to net zero by 2050. BERDO requires annual reporting on water and energy usage, requires third-party verification every five years, and includes increasingly stringent property emissions standards. Starting in either 2025 or 2030, building owners will also need to comply with building emissions standards (i.e., emissions limits). These emissions standards decrease over time, with all buildings expected to reach net-zero emissions by 2050.

Local Law 97, New York City

LL97 Green House Gas Emissions Reduction. "In New York City, over two-thirds of greenhouse gas (GHG) emissions come from buildings. Local Law 97 of 2019 as amended is one of the most ambitious plans for reducing emissions in the nation. Under this groundbreaking law, most buildings over 25,000 square feet are required to meet new GHG emissions limits beginning in 2024, with stricter limits coming into effect in 2030. The goal is to reduce the emissions produced by the City's largest buildings by 40 percent by 2030 and to net zero by 2050." NYC.gov

Alternative pathways. If a building does not already meet 2030 carbon emissions thresholds, there are alternative measures that owners can pursue to ensure buildings are meeting some basic energy efficiency measures. These Prescriptive Energy Conservation Measures (PECMs) act as a retroactive code. Certain utility companies have created incentive packages and lists of pre-approved contractors that can help incorporate the prescriptive pathway measures. The prescriptive pathway could be replicated to drive energy efficiency projects in less sophisticated or affordable housing buildings. The Building Energy Exchange (for professionally managed buildings) and NYC Accelerator (for the general population) both provide education on LL97 compliance.

Additional measures. To further encourage developers to incorporate low-carbon practices and products that will help the City meet its climate goals and LL97 requirements, the City has also deployed the following measures:

- **City of Yes zoning.** In December of 2023, New York City adopted a "City of Yes for Carbon Neutrality" approach to modernize the City's zoning regulations

Prescriptive Energy Conservation Measures (PECMs) for LL97 Compliance

1. Adjust temperature set points for heat and hot water
2. Repair heating system leaks
3. Maintain heating system
4. Install individual temperature controls or insulated radiator enclosures
5. Insulate heating and hot water pipes
6. Insulate steam system condensate tank or water tank
7. Install heating system sensors and boiler controls
8. Repair or replace steam traps
9. Install or upgrade steam system master venting
10. Upgrade common area lighting to comply with New York City Energy Conservation Code
11. Weatherize and air seal, where appropriate
12. Install timers on exhaust fans
13. Install radiant barriers behind all radiators

Source: NYC Accelerator

to support its ambitious climate goals and incentivize the development of lower-carbon projects. The approach is designed to address four main categories: make it easier to generate renewable energy; make buildings greener and more efficient; support the growth of electric vehicles and e-micro mobility; and reduce waste and stormwater run-off. These zoning updates are making positive changes in sustainability across New York City.

- **Housing Preservation and Development (HPD) Design Guidelines for new construction.** The Division of Building and Land Development Services (BLDS) issued new design guidelines for how the agency evaluates proposed developments for multifamily new construction, supportive, and senior housing projects. Projects must meet the agency's core principles as a prerequisite to loan closing for any new construction project developed under applicable HPD loan programs. These prerequisites include factors such as strong urban design, accessibility, equity, promoting better health outcomes, minimizing climate impact, and enhancing climate resiliency. New construction projects subject to the guidelines are also required to certify with 2020 Enterprise Green Communities with the NYC Overlay or LEED v4 Multifamily Midrise (Gold or Platinum) certification.
- **Resilient & Equitable Decarbonization Initiative (REDi)**. HPD has launched REDi to fund capacity building and scale

Insights from the Developer

L+M Development Partners

With more than 23,000 housing units under management and as an active developer of affordable housing, L+M Development Partners is taking a proactive approach to its energy efficiencies and emissions, acting today with future LL97 compliance in mind. The L+M team noted the following items as those they would reconsider going forward based on their lessons learned to date.

- Carefully consider in-unit measures. Even simple in-unit upgrades should come with education and outreach to residents so they can derive the most benefit from them.
- Align capital planning work with LL97 compliance retrofits where possible. L+M is using the "mediated resolution" option to help align LL97 retrofits with planned capital improvements being made at a number of properties. Where capital improvement plans were too far out for compliance, L+M pursued the PECMs.
- Benchmarking can be a critical tool in understanding how buildings can comply. L+M used benchmarking during the planning process and continues to do so year over year. This work helped the team understand which buildings were already compliant with LL97 from an emissions perspective and which would need on-site improvements to comply.

equitable decarbonization, beneficial electrification, and resiliency within the agency's new construction pipeline and as outlined in its Design Guidelines for new construction of affordable housing.

- **Clean Energy Initiative Program.** At the state level, New York State Energy Research and Development Authority (NYSERDA) funding is passed directly to New York City agencies, which can quickly deploy those funds locally in support of voluntary compliance and corporate sustainability programs like the one in place at Vornado Realty Trust.
- **Resilient & Equitable Decarbonization Initiative (REDi).** HPD has launched REDi to fund capacity building and scale equitable decarbonization, beneficial electrification, and resiliency within the agency's new construction pipeline and as outlined in its Design Guidelines for new construction of affordable housing.

Workshop Insights

Returning to the workshop questions posed by DHCD and PHDC, workshop participants turned to tackle the questions and provide answers and advice based on their professional expertise and informed by the presentations and case studies.

How does the regulatory environment in peer jurisdictions affect the preservation of affordable housing (both decarbonization and affordability)?

Participants agreed that building performance regulations are key to making substantive progress towards building decarbonization.

Pursue supportive regulations. Regulations can be enacted, as in the case of Boston's BERDO or New York City's LL97, to address the following:

- Requirements for certification schemes or prescriptive pathways that result in energy savings

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Workshop participants tour an affordable housing development that is being updated and retrofitted for energy efficiency to help ensure long-term affordability of utilities for tenants.

Affordable Housing Ordinance

PILOT Reform, Detroit

In Detroit, Michigan, the Detroit Preservation Partnership is a collaboration of 14 organizations working together to support housing affordability across the entire community. The group recently advocated for reform in Michigan's 2022 Payment in Lieu of Taxes (PILOT) ordinance.

In 2024, the PILOT ordinance, which was designed to facilitate the construction and preservation of affordable housing, was adjusted to include the following requirements:

- Agree to lease units to tenants with qualifying incomes and restrict rental amounts for the duration of the PILOT.
- Meet investment thresholds of \$15,000/unit for vacant rehab projects or \$5,000/unit for occupied rehab projects.
- Comply with the Buildings, Safety Engineering, and Environmental Department regulations, including Certificate of Compliance or Certificate of Occupancy.
- Maintain "Good Standing" with the City of Detroit.

- Requirements for certifying consultants
- Offsets from commercial buildings that support affordable housing

In all of these instances, affordability pursuits and decarbonization efforts should be allowed to align with capital cycles and provide opportunities for incremental and/or pre-approved decarbonization solutions.

Capture and share data across teams. The integration of data across platforms and across departments will help ensure that the information captured is holistic and informative. Ensuring that data from sustainability efforts can flow to the housing team will help support the City's more complete understanding of how the buildings are performing.

Create an affordable housing development services team. This one-stop-shop can help developers but will only do so if the process or roadmap is clear and all of the needed parts and pieces to be addressed are clear. Without these key elements, it will not be possible to act as a "one-stop" team.

Enforcement is important and should be reliable. The City struggles with enforcing building performance standards now but can learn from its peers, particularly New York City's Design Guidelines and process. The key is to create a reliable enforcement process and mechanism that can be communicated, understood, and expected.

The Passive House Movement

Passive building is a set of design principles for attaining a rigorous level of energy efficiency while also creating comfortable indoor living spaces. These principles can be applied to all buildings, including single-family homes, multifamily apartment buildings, schools, skyscrapers and more. (Phius)

The benefits of passive house construction translate into ultra-low energy use and reduce energy cost burdens for tenants and their families. More broadly, the pursuit of passive house certification positions buildings so that they are typically 70 percent of the way to also achieving net-zero certification.

There are important equity benefits that come from passive house measures. High-quality indoor air becomes the standard and thermal comfort is improved, both of which support the health and wellbeing of building occupants. The reduced ongoing operational costs and increases in asset value over time can support long-term affordability and reduce the risk of gentrification and tenant displacement.

Finally, passive house construction challenges previous environmentally harmful policies and development procedures and seeks to advance environmental justice instead.

As a former board member of The Passive House Network, workshop presenter Derrik Tillman and his team work to incorporate a broad array of passive house measures into their developments, including energy efficiency and carbon reduction, thermal comfort, noise reduction, equitable indoor air quality, FITWEL certification, stormwater management, and biodiverse plantings on campus grounds, roof gardens and green roofs where possible. These efforts reduce the energy cost burden for tenants and improve quality of life while reducing the carbon footprint of the buildings.

Passive house is becoming the baseline standard in New York City and Boston for new affordable housing construction. Developers cannot win funding awards from New York's housing authorities without incorporating Passive House measures. There is a three percent premium for building to these standards in Boston and New York, and it is the quickest path to compliance. It has taken almost ten years for this market shift to occur, but affordable housing is now at the forefront, ahead of market-rate housing, because of the regulatory environment.

Funding for Decarbonization

Developers of affordable housing have a rather complex funding environment to navigate to bring their projects to the market. Similarly, energy efficiency and decarbonization pursuits must also chase a wide variety of funding sources to make their projects financially viable.

Current Affordable Housing Funding Sources

Federal funding. Federal support for affordable housing typically comes from the U.S. Department of Housing and Urban Development (HUD) through programs like 811 for disabled residents and 202 for elderly residents. Both are highly competitive programs and funding is limited. Additional funding can come through Congressional appropriations for HUD's Economic Development Initiative, but the process is long, exposing the funding to potential budget cuts along the way.

State funding. At the state level, the Pennsylvania Housing Finance Agency (PHFA) issues Low-Income Housing Tax Credits and State Housing Tax Credits, but again, both are extremely competitive and projects seeking the former must be fully funded and those seeking the latter cannot use a multi-fund investment approach. The Pennsylvania Housing Affordability and Rehabilitation Enhancement Fund (PHARE) is more flexible but has a $1 million per project per year maximum. The Department of Community and Economic Development (DCED) has two programs of note, the Redevelopment Assistance Capital Program and the Local Share Account (LSA) Philadelphia program, but both are also limited and highly competitive.

Local funding. In Philadelphia, DHCD utilizes a combination of federal and local funding sources to finance affordable housing. Federal entitlement grants like the Community Development Block Grant (CDBG) and the HOME Investment Partnerships Program have stricter compliance and monitoring requirements, while local sources like the Housing Trust Fund, and City-issued bonds are often more flexible. DHCD distributes these funds through a competitive RFP process annually, awarding each project up to $3 million or up to $3.5 million if the project also includes commercial space. While most RFPs are issued in coordination with PHFA's timeline and contingent upon the project also receiving 9% or 4% LIHTC, the City also periodically issues non-LIHTC RFPs. This option allows smaller projects with 25 or fewer units to submit an application for funding. In addition, the Philadelphia Housing Authority has project-based vouchers and a capital fund, but the former cannot be paired with HOME funding, and the latter is managed on a project-by-project basis without a formal request for proposal (RFP) process.

Private sector funding. Additional funding can be found through a variety of private sector sources. The Federal Home Loan Bank Affordable Housing Program, which is capped at $2 million, has additional points to award projects for achieving certain levels of energy efficiency. Grants from charitable foundations and corporations can provide supplemental funding but are typically offered at lower amounts and rarely cover expenses beyond predevelopment. Banks and tax credit investors may also be good resources, but equity pricing is going down and interest rates are high, making these expensive sources.

Current Energy Funding Sources

Federal funding. At the federal level, energy funding through the Green & Resilient Retrofit Program (GRRP) and the Greenhouse Gas Reduction Fund (GGRF) have been mostly cut by White House reductions. While the courts work through the legitimacy of those cuts, the future remains uncertain. Stone shared a recent experience in which a $10 million deal had funding from these sources cut in the midst of the closing; since then, the developer has stopped pursuing energy-saving initiatives. For other developers, the uncertainty of continued funding availability is inspiring a shift; even if the funding comes in, the developer can no longer trust that it will continue to be available. HUD is supportive of energy projects but funding can still be challenged and changed while the injunctions work through the court system.

State funding. State funding is available through the PHFA and Department of Environmental Protection Home Efficiency Rebates (HERS). The amounts are less than $100,000, and the program requirements are such that some developers note that the costs associated with acquiring the rebate are often greater than the funds recovered.

Local funding. The new Green Bank affiliate of the Philadelphia Energy Authority, Philadelphia Green Capital Corp., is up and running, but it is too early to gauge the accessibility and impact of this resource.

Private sector funding. The Section 45L Energy Efficiency Home Credit applies to new single-family, multifamily, and manufactured homes, as well as existing homes that undergo a deep retrofit. At present, the pricing around this credit remains uncertain.

Affordability + Energy

Tying together affordable housing and energy efficiency in Pennsylvania can be challenging. For those developers using LIHTC, they can only seek points in their applications for one of the following programs: reduced HERS Index with 5 points and $334,000/unit; Passive House with 10 points and between $340,000–370,000k/unit; or Zero Energy Ready Home with 8 points and between $280,000–375,000/unit. It appears that most developers in Philadelphia are using the Zero Energy Ready Home approach, although it is becoming increasingly competitive. Building one of these programs into the LIHTC application would be a welcome improvement.

Green certification in LIHTC applications is similarly challenging in that points can only be awarded through one program. The Enterprise Green Communities 2020 program provides 10 points and is the most affordable path. The ICC 700-2020 National Green Building Standard - Silver and the LEED v4 certifications both offer 10 points but each is more expensive than the Enterprise certification.

In most of these instances, pursuing these certifications requires assistance from an experienced consultant to address the reporting requirements through each phase of the project from application to post-construction. Developers should plan to spend approximately $74,500 for these services, which come out of pre-development funds.

Barriers to LIHTC Production

The barriers that limit the delivery of affordable housing units range from cost and financing issues to environmental challenges, to delays in entitlement and permitting work. These barriers are not without solutions, however, some of which are within jurisdictional control.

- The high costs of construction and the lack of sufficient gap financing could be addressed through more soft funding for construction costs reserved for LIHTC application projects. Increasing the maximum requests in existing City applications would also help, e.g., raising the $3 million maximum to $5 million. Low-fee, low-interest construction and bridge loans up to 100 percent affordable would also assist considerably.
- The availability of acquisition and pre-development capital could be increased through recoverable grants or cheap, low-

HACE’s Hancock Manor apartments are undergoing significant redevelopment to improve energy efficiency and make better use of available space for tenants seeking affordable housing options.

interest loans for projects that intend to achieve one of the programs within the LIHTC application. Additionally, it would be helpful to make funding eligible for all pre-development costs, including energy consultants, energy studies, and testing for preservation projects.

- Entitlement and permitting delays frequently cost developers time, which adds costs to a project and limits future development production. Jurisdictions can provide guaranteed expedited and consistent processing for affordable housing and could provide exemptions for 100 percent affordable housing.

BERDO Funding, Boston

At the time of the workshop, the following finance measures were available to help developers meet BERDO requirements:

- **Mayor's Office of Housing (MOH) funding.** MOH provides funds for preservation projects, but these are generally dwarfed by the number of new construction deals.
    - » MOH Technical assistance **(pilot program).** Grants of up to $10,000 are available for strategy work relating to energy consumption, BERDO exposure, and decarbonization scope. These grants allow MOH to come alongside the developers and learn from the reports issued by the consultants hired to provide the assistance. The information is also shared at the state level where policy decisions are being made.
    - » Deep energy retrofit (DER) subsidy **(pilot program).** MOH provides grants of up to $50,000 to be used during construction to support DER work.
- **American Rescue Plan Act (ARPA) funds.** Pilot programs remain in place that leverage ARPA funding for certain limited development activities, but there is no new funding on the horizon that will support additional measures.
- **State tax credits.** At the state level, tax credits and soft subsidies are available, typically going to new construction projects. The credits that are allocated for preservation and affordability often focus on moving market-rate projects to ones that are affordable. In each of these instances, decarbonization efforts do not always fit into the credit application.
- Climate Ready Housing. Another state-level program, Climate Ready Housing funds deep energy retrofits in existing multifamily affordable housing. Annual funding of $16 million funds 10-15 projects that are committed to very low-carbon emissions in existing building renovations.
- Massachusetts Department of Energy Resources (DOER) Affordable Housing Decarbonization Grant Program. Created in 2023, this program funds deep energy retrofits and decarbonization projects for low- and moderate-income residents. DOER has awarded over $50 million in funding across the two rounds, helping to decarbonize over 1,300 units.
- Massachusetts Community Climate Bank (MCCB). The MCCB uses $50 million in dedicated funds to support new construction of decarbonized housing, clean energy retrofits, and housing-based clean energy projects.

The Role of the Boston Housing Authority

The Boston Housing Authority operates housing, administers vouchers, serves as a borrower and lender (via past developer fees), and acts as a grantor of funds the City receives for public housing projects. The Housing Authority also works with MassHousing, the state's first-time homebuyer assistance (FHA) entity, which is also on a path to becoming a green bank. The City is a partner in the Building Performance Center and serves as a major grantor of funds. The Center has steep goals and associated costs are expected to reach $1 billion. The Housing Authority is pursuing a 40 percent Energy Use Intensity (EUI) reduction RFP process. It is also working to move from boiler replacements to energy-efficient heat pumps. Through it all, the Housing Authority is focused on ensuring that the tenant is not left shouldering the costs of the improvements and instead enjoys cost savings when the improvements are complete.

Financing Innovations, New York City

As typical green financing sources do not yet work for affordable projects, the following innovative financing programs are providing funding assistance in New York City.

- **Direct injection programs.** Subsidies can be directed through NYC's affordable agencies with no extra effort from the developer and it seamlessly fits into the capital stack at closing.
- **Affordable housing offsets.** The Affordable Housing Reinvestment Fund generates offsets from decarbonization projects in affordable housing buildings for purchase by market rate and commercial entities for LL97 compliance. This could create funding for the REDi program.
- **Greenhouse Gas Reduction Fund.** Community Preservation Corporation, under Climate United, is using this Environment Protection Agency fund to integrate green capital into projects in a manner that could be adopted by other CDFIs. (This is under litigation, however, and will need to be revisited.)

Affordable Housing Leverage Fund, Detroit

As a part of Detroit's Affordable Housing Leverage Fund, **Detroit Housing for the Future Fund (DHFF)** supports affordable housing by deploying private grants and low-interest loan capital to complement

Community Investment Corporation

Loan and Grant Funding in Chicago

Chicago's Community Investment Corporation (CIC) is a community lender for small business owners and small developers working in underdeveloped communities. As a nonprofit community development financial institution (CDFI), CIC has provided $1.8 billion in loans, in amounts ranging from $200,000 to $7 million, which have helped stabilize nearly 70,000 buildings to date. CIC prefers to be the first lender on a project and uses its position and tools to create a loan package tailored to each developer's goals.

CIC offers loan and grant programs for soft debt and customized loan packages for developers. These funding options include:

- A Flex Loan in the form of a high-leverage first mortgage at an 80 percent loan-to-value (LTV) rate.
- Equitable Recovery program, which is a low-cost, temporary vehicle to reduce the LTV of the first mortgage.
- The Federal Home Loan Bank provides funding for new construction.
- The Opportunity Investment Fund provides interest-only mezzanine debt to reduce equity requirements and ensure affordability.
- TIF Multifamily Purchase Rehab provides grants to upgrade distressed multifamily and mixed-use buildings in designated TIF districts.
- The Woodlawn Construction Loan Fund provides loans for owner-developers rehabbing or building new homes in the Woodlawn community.
- The Single Room Occupancy (SRO) Preservation Program provides grants to improve building and unit conditions.

While still rather new to energy and water efficiency work, CIC has funding support from Chase and ComEd (the electric utility) for projects in CIC's portfolio. Early efforts to reduce energy and water consumption in CIC's portfolio include installing new low-flow faucets and shower heads and using other water management tools, such as downspouts and floor tiles, to reduce stormwater runoff. ComEd is providing up to $8,000 per unit to replace gas appliances with electric appliances.

and leverage public investment. These additional investment resources include the City of Detroit, Michigan State Housing Development Authority (MSHDA), tax credits, and other affordable housing finance tools. LISC manages DHFF as well as the work associated with the applications and the preliminary underwriting processes.

Through all of its programs, the Affordable Housing Leverage Fund uses one application and provides a clear timeline, with specific roles and responsibilities for all parties, allowing applicants to apply for multiple programs using just one form. As the program continues to evolve, it is benefiting the developments as well as the broader city of Detroit.

Workshop Insights

How might the City complement gap financing for full rehab projects with options for smaller, more gradual interventions?

Recognize owner motivations. It is also helpful to identify and understand the long-term motivations of building owners. Many of the affordable housing developments are held by nonprofit organizations that are interested in reducing their operating expenses. Other building owners, such as some market-rate for-profit developers, may be interested in upgrading systems as a function of improving market position and investing in an appreciating asset.

Create a bulk purchasing mechanism or system. For the City of Philadelphia, there could be potential to build a cooperative or collaborative system that spearheads bulk purchases of systems or components on behalf of building owners. With this type of framework, the City could negotiate bulk purchases and align deployment to building owners when those building's systems are nearing the end of useful life.

Consider assisting with these other tools. Other tools the City could offer that could assist building owners in making building system investments and upgrades include:

- Assisting with soft costs that could be leveraged for grants and loans
- Providing additional tax abatement
- Using operational savings as an income stream
- Tailoring gap financing to fill now-missing federal funding

Advice for owners and developers.

It might also be helpful for the City to play a part in helping building owners and developers identify how and where financing mechanisms could facilitate energy-efficiency upgrades. As a function of these conversations, the following items should be considered.

Understand and plan for project alignments. When it comes to creating better alignments between financing for decarbonization improvements and existing cycles of financing, developers, owners, and operators are going to be more interested in the longevity of the systems and how each aligns with capital events. It is critical to identify when building systems will need replacing and windows of potential funding opportunities. Building owners and developers who create and reference a checklist of replacements, based on the potential for the biggest return on the investment can begin to incorporate updates as systems require and funding resources allow.

Align with subsidy expirations. There is also an important potential alignment between windows of financial resources and expiring housing subsidies. Moving to energy-efficient systems at these types of convergence points can often better leverage the available funding and reduce the complexities of multiple rounds of financing between budgeted capital cycles.

Explore opportunities to underwrite to actual expenses. The 20-year cash flow reports required of affordable housing projects do not break out energy costs. With the right measures in place, the tenant will pay less than the utility allowance, but the developer cannot yet underwrite to that lesser amount and instead must write to the utility amount. If developers could instead reflect the value of the energy saved and leverage that amount, it could be used to fund the energy-efficiency improvements.

Technical Assistance and Capacity Building

Business as usual will not achieve decarbonization goals. Developers, building owners, building managers, and maintenance staff will all benefit from technical assistance and capacity building support as they begin to incorporate lower-carbon processes and products into their building and development efforts.

The development community is not always familiar with decarbonization programs or does not know where to start or how to manage the applications, reporting, and compliance. Regular property management training sessions can help improve tenant management (and eviction), leasing management, and efforts to comply with new regulations. Training sessions like these can also prove helpful for emerging developers who are just getting into the business.

Residents, too, will benefit from informational and educational resources that will help support their use of new products, ensure that they are achieving the cost savings that energy efficiency brings, and provide protection for the investments in new technologies.

Capacity Building, Detroit

Preservation Partnership Assistance. What began as a preservation action plan for building owners soon became an iterative approach to helping building owners find tools to advance preservation work along the entirety of their development path. These same building owners are interested in reducing operational expenses, which has strengthened the Detroit Preservation Partnership's commitment to a pragmatic approach to the work, rather than leading with one that focuses first on climate and environmental messaging. To date, the Partnership has delivered:

- 1339 energy assessments
- Capital needs assessments for 581 homes
- Financial modeling for 418 homes
- Phase 1 environmental assessments for 248 homes
- Planning support for homebuyers of 332 homes
- Multifamily housing database
- Scatter-site preservation resources guide
- Preservation risk profiles for existing project types, which helped prioritize properties and naturally occurring affordable housing (NOAH) and LIHTC properties in particular
- A training series for owners and property managers
- Policy and advocacy work in coordination with governmental partners

Preservation Predevelopment Program. The second phase of the Preservation Partnership focused on providing predevelopment services for multifamily projects. Funded in the near term with $750,000 in ARPA funds, the predevelopment program allows the City of Detroit to provide services and functions—through Enterprise—that it would not have had the ability to do alone as a public sector

Detroit's Preservation Partnership

With a mission to make home and community places of pride, power, and belonging, and to shape both into platforms for resilience and upward mobility for all, Enterprise Community Partners provided leading support to the Detroit Preservation Partnership in order to advance housing affordability in Detroit. The Detroit Preservation Partnership (the Partnership) is a collaboration of 14 organizations working together toward three primary goals:

- Map and build out the existing ecosystem in Detroit supporting the preservation of affordable housing.
- Support multifamily affordable housing preservation to build a pipeline of deals.
- Support homeownership planning for Detroit's existing scatter-site LIHTC rental developments eligible for sale to low-income homebuyers.

At one point, there were also plans to provide deeper energy assessment services to homeowners, but the funding for that work is no longer available.

entity. These services included introductions to lenders for financing, connections to additional predevelopment resources, energy assessments, capital needs assessments, phase 1 environmental site assessments, financial modeling, and tenant engagement services. In order to qualify for these predevelopment services, buildings must house four or more units and be occupied or undergoing rehab for affordable housing. Additionally, the developer participant must have site control of the subject property and must sign an agreement with Enterprise to adhere to the City's affordable housing preservation requirements.

Training Programs, New York City

Training is critical to ensure that building managers and maintenance staff are operating the buildings and the systems properly. The training must be provided and required to help ensure that the new systems and products are fully understood and properly maintained. It is also helpful to note that training can be funded as "operations" and thus addressed outside of other capital expenses.

Local Law 97 has encouraged some developers to evaluate and prioritize the updates that will make the greatest impacts on their tenants, buildings, and carbon emissions. Through this evaluation, they are continually looking for lower-cost measures that have out-sized impacts on their tenants and the environment.

Joe Backer provides insights from Boston and shares steps that the Mayor's Office of Housing has taken to support housing affordability and emissions reductions.

Boston's Acquisition Opportunity Program

The City of Boston has a program to partner with a mission-driven group and provides that group with a subsidy that puts the partner on equal footing with a market-rate buyer, making the mission-driven organization as much as or more competitive to buy a building and retain the affordability. (Boston has an RFP out there that facilitates these purchases, particularly for NOAH.) The City also deploys this resource as a pre-approval letter for developers who want to go out and find a property. (In order to keep the process moving, the City keeps capital costs out of the program and mostly allows properties at risk to be stabilized.) This program has helped stabilize hundreds if not thousands of affordable units. This is particularly helpful as these buildings will soon be subject to BERDO.

Workshop Insights

What training or other support would enable owners of affordable multifamily properties to successfully plan for and implement preservation and decarbonization projects effectively?

Create a concierge for affordable housing projects. At the City of Philadelphia, an affordable housing concierge would be instrumental in establishing a process for managing an expedited permitting process for affordable projects. This concierge could also host a central application for programs and help developers and building owners understand which programs might align with a particular project.

Lead with mapping the entire process in pursuit of clarity for all. Before any training occurs, workshop participants believed strongly that a process map was required to ensure and support ongoing clarity of what happens in these projects and when. A function of this process mapping should also identify the point at which energy process consultants should be brought in to incentivize energy modifications and elements. The process map should also identify which constituents will need to be trained on the new systems and products and when.

In Boston, a Mayor's Executive Order is now in place in order to expedite the review process of affordable projects and ensure alignment with the process map.

Training needs aligned with audiences, support, funding, sequencing, and more. As workshop participants noted, offering blanket training alone will not change anything. The intention of each training must be clear, including the intended audience, the core message(s), the intended results, and the steps required to deliver the training. Training is a critical implementation function that will require support, funding, and sequencing to be effective. Operators, residents, and building managers will need information about any new mechanical systems as well as the different products now in use across the property.

Encourage developers to account for training as a function of pre-development. Cost estimations associated with decarbonization work are rarely a straight line between design, bid, and build. Value engineering often eliminates decarbonization efforts and the training that should accompany them. By factoring training expenses into pre-development costs, the support is more likely to remain in place when other project costs are trimmed.

Sponsor support assessments. The City could assist developers by sponsoring energy assessments. This support would help lower the barriers to entry for developers seeking to decarbonize projects. The City could also provide support for procurement services, perhaps creating a collaborative procurement process for developers and building owners pursuing technical support and energy-efficient materials.

Consider providing incentives or points tied to existing standards. Whether it is necessary to create a new standard or tie into an existing standard, the City should consider how it could identify and incentivize energy project recommendations that would align with existing benchmarking requirements. This streamlining helps buildings achieve reductions without the need to create an entirely new and separate system.

Other questions to consider

Is the asset stabilized and does that affect the approach? The workshop participants also considered how and if the above training and process approaches could or should differ between an asset that is stabilized and one that is not. The sequencing may be different between stabilized and unstabilized assets may require a slightly different or nuanced approach and should be considered.

Is there a neighborhood-scale approach? Looking back at the redevelopment work that has been completed in the Sharswood neighborhood, the participants wondered if there might have been an opportunity to have approached the building improvements on a neighborhood scale and, in so doing, created greater impact, a potentially faster delivery time, and important development cost savings. Using this approach for energy improvements, using collaborative purchasing power and sequencing energy contractors to make better/more efficient use of their time, could be planned and incorporated into larger scale projects for greater impact.

Project Case Studies and Supportive Technologies

An important aspect of the workshop was a series of tours of affordable housing developments in Philadelphia and case studies of projects in peer cities. These insights into redevelopment and affordable housing preservation efforts provide real-world perspectives on financing challenges, opportunities to serve particular tenant segments, energy-efficiency pursuits, and more.

HACE Community Development Corporation, Philadelphia

In Philadelphia's St. Hugh neighborhood, HACE Community Development Corporation is continuing its mission of renovating and preserving affordable housing units for Philadelphia's families, veterans, and individuals.

HACE Community Development Corporation is redeveloping Hancock Manor, a six-story former YWCA building in the city's St. Hugh neighborhood, into critical affordable housing units for the city's north side.

The renovation, which is completely re-envisioning the building's first floor and mechanical systems, will also deliver 21 newly constructed one-bedroom apartments to better suit the residents who will soon call the building home.

The newly constructed apartments and building renovation will feature several energy-efficient improvements that will reduce utility costs and begin to move the building closer to a low-carbon footprint. These measures include:

- High-efficiency split-system heat pumps in the new apartments with fresh air ducted from the exterior of the building.
- A high-efficiency split-system heat pump in the corridors with ducted outside air provided from the exterior.
- LED and Energy Star-compliant fixtures for interior lighting.
- Energy Star-compliant appliances.
- Electricity for each unit will be individually metered.

The tour of Hancock Manor included new construction areas, renovated apartments, and the building's historic lobby.

- Low-flow fixtures for bathroom sinks, bathtubs, and kitchen sinks

In addition to Hancock Manor, HACE is likewise transforming a 1990'-style townhome development into a development of choice for families seeking affordable accommodations. Lining one city block with backyards open to a secure courtyard, the Villas Del Caribe is an oasis of affordability for families with children. The 81 units of affordable housing were developed with support from the Pennsylvania Housing Finance Agency Low-Income Housing Tax Credit Program and are also being updated with energy-efficiency measures.

Mid-City Apartments, Philadelphia

Philadelphia's Center City is an area known for Rittenhouse Square and valuable surrounding real estate. The dense urban environment of this part of the city, with easy access to transit and other public services, is attractive to individuals who are struggling with finding stable housing.

Originally developed as a YWCA, the Mid City building on Chestnut Street in Center City was last renovated in 1998 and today houses both apartments for formerly unhoused individuals and an unaffiliated charter high school.

With assistance from the City of Philadelphia, Mission First assumed ownership of the building in 2016 with the intention of maintaining the deeply affordable housing units. Since then, the team at Mission First has been renovating the apartments to better suit its tenants and separating the entrances on the first floor to better suit both the high school and the building's residents.

All apartments will be updated with new flooring, appliances, light fixtures, doors, and kitchen and bathroom fixtures and finishes. A new roof and windows as well as new hot water heaters and HVAC systems will be installed. Common areas will receive all new finishes, lighting, and cabinetry. Existing electrical panels, breakers and circuits, lighting, and electrical devices will be replaced.


ULI

The Mid City Apartments on Chestnut Street provide critical housing opportunities to individuals who have recently experienced homelessness.

When complete, the Mid City Apartments will feature the following sustainability measures:

- Replacement of all windows with clad units with low-e insulated glass.
- Replacement of all kitchen appliances with Energy Star-certified products.
- LEED V4 compliant ceiling tiles.
- Walk-off mats in the entrance lobby to reduce contaminants and improve indoor air quality.
- LEED v4.1 compliant, "FloorScore" certified bio-based flooring in common areas.
- "FloorScore" certified, LEED v4.1 compliant flooring in the individual units.
- New white roofing material with additional insulation.
- New highly-efficient energy-saving mechanical systems.
- Updated building ventilation systems to provide fresh air to each unit.
- Ducted range hoods and bathroom exhausts.
- New high-efficiency water heaters.
- New low-flow "WaterSense" fixtures.
- New energy-saving LED fixtures with motion detector switches in public areas.

In addition to Mid-City Apartments, Center City is also home to Kate's Place on Sansome Street, which in 2021 received $12 million in

9 percent LIHTC to finance renovations of its 144 affordable housing units and related systems.

The John Fox Apartments, a 1963 building housing 273 units of senior housing within 17 stories is also in the area. The apartments, which house a total of 366 residents, will remain affordable for another 30 years. Six percent of units house seniors with disabilities.

Boston Case Studies

The following case studies were shared with workshop participants as developments to watch, with each pursuing some form of deep energy retrofit that could be applied elsewhere.

- **Hano Homes**. This zero-carbon DER delivers 20 apartments for low-income residents. While the developer is not going to be able to achieve passive house certification, energy usage has been reduced by nearly 70 percent through electrification and DER measures, including rooftop solar and a carbon-storing insulation system.
- **Mission Main Apartments**. In this project, the developer leveraged funds from a closing on other buildings on the property to test DER measures on pilot buildings with the intention of informing future projects across the developer's portfolio. In this public-private partnership, the City of Boston owns the land and the developer owns the buildings, which helps to support the long-term affordability of the housing units.
- **Brian J. Honan Apartments**. In addition to $1.5 million from MOH, this project was initially financed with 4 percent LIHTC. Due to a bottleneck in the credits, the developer has switched to other funding sources but is still pursuing the DER measures, including a high-performance thermal envelope and all-electric systems across the 50 units.

Improvements to Hano Homes has increased energy efficiency for tenants.

Mission Main served as a testing ground for DER measures that will be rolled out in additional buildings.

Brian J. Honan Apartments updated all systems to electric across all housing units.

Although the total unit count across these projects may be high, the building typologies remain relatively small. Boston may soon see high-rise DER projects underway, but at the time of the workshop, these low-rise projects were furthest along.

- **Mildred C. Hailey Apartments.** The redevelopment of 253 apartments and construction of 420 new apartments on this public housing campus provided developers and the Housing Authority with a unique opportunity to pursue energy-efficiency measures and perform a side-by-side comparison of each, including evaluations of the respective processes and funding sources. The DER proved to be an expensive pursuit, but still $100,000-150,000 cheaper than razing existing structures and building new from the ground up. The new construction is adding needed density, however, and meeting other goals that the renovation cannot. Decarbonization measures included the installation

DERRICK TILLMAN

The Miller School is being converted into affordable housing units in Pittsburgh.

DERRICK TILLMAN

The Miller School redevelopment features a number of public art installations, including this mural by Pittsburgh artist Cameron “Caso” Nesbit.

of air-source heat pumps, hot water electrification, and the installation of energy-efficient windows, roofing, and exterior cladding. Solar photovoltaic panels were also added.

- **St. Botolph Apartments.** The redevelopment of this 132-unit building was managed in-house by the Housing Authority’s redevelopment team and supports affordability in an area where housing is known to be expensive. The deep energy retrofit of the apartment building included adding electric resistance to heat pumps, hot water electrification, and adding solar panels. The building has seen a 40 percent use intensity reduction.

Miller School Residences, Pittsburgh

In Pittsburgh’s Lower Hill District neighborhood, the historic Miller Elementary School is undergoing an adaptive reuse, converting from an elementary school building into mixed-income housing. The school building is part of a larger project, which began with the construction of 36 units of affordable housing in an adjacent newly constructed building.

The historic school building is being converted into 41 new housing units, 20 percent of which will be affordable. The historical significance of the building and the people who once worked and learned within will be depicted in new public art to be placed around the exterior of the building. John Brewer, Pittsburgh’s first African American public school principal and an education innovator, will be honored in the building’s new John Brewer Lobby.

Innovative Technologies

The industry is full of product innovations that can begin to make a big difference.

- **In-unit heat pumps.** In-unit heat pumps are a great model and can be treated like an appliance much like an in-window air conditioning unit. Spaces can be tight, and a heat pump can be placed into a window opening and plugged into the wall. There is also the opportunity for a tenant to buy and own the heat pump and then take it with them when they move. This provides the tenant with more control, acting when they are ready, rather than waiting on the building owner to fund or participate in the product purchase.
- **Electric cooking.** The L+M team is also exploring electric cooking appliances that are plugged into a typical electrical outlet fueled in part with a battery.

Recommendations

Philadelphia's climate and decarbonization goals can lead to a great deal of important change across Philadelphia's built environment. Through a mix of funding and financing, regulatory tools, and capacity building and training, attaining decarbonization and long-term affordability are possible. Along the way, the City will need to communicate openly and frequently with owner operators and developers to ensure that everyone who may be affected by policy and program changes knows what is coming and what will be expected. Strong partnerships will be key for achieving all of the recommendations below.

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> Training developers alone will not change anything. It must also include operators, residents, and asset managers.
>
> *–Workshop participant*

ULI

Chris Perkes, ULI's Decarbonization and Net Zero Imperative senior manager, walks participants through the workshop scope questions.

1. **Develop clear strategies and ambitious priorities.** Leverage the City's unique, high-level view of the affordable housing landscape to set clear priorities for affordable multifamily preservation and decarbonization.

    a. The City is in a unique position to see a wide range of projects and is closer to the work than state agencies. That holistic view should be used to find feasible ways to support ambitious decarbonization efforts. With proactive leadership at the City level, the ecosystem and market will follow.

    b. Comprehensive information about Philadelphia's affordable multifamily housing building stock is essential. The City's current effort to complete a building condition and funding gap analysis is an important first step.

    c. Lead with affordability and ensure that energy goals are embedded from the beginning. Decarbonization can promote affordability, but the work should be led first with affordability goals, keeping them front and center.

    d. Interventions should be directed across the entire ecosystem, not just at developers. It takes developers, owners, operators, building managers, and residents to achieve effective decarbonization.

2. **Pursue impactful regulation that builds on learning from peer cities**. The City can influence the market through thoughtful regulation paired with targeted investment.

    a. Building Performance Standards and other key decarbonization policies are essential for bringing property owners to the table and meeting climate goals. When thoughtfully designed and implemented, BPS can create a market for in-demand areas of expertise and construction materials in ways that will bring down construction and operating costs for everyone over time.

    b. The experiences of Boston and New York City show that regulations should take building capital cycles into account when setting compliance timelines.

    c. Decarbonization can reduce costs and improve quality of life, but if it is not made a priority at the start of a project it can increase costs and tip the project out of affordability.

3. **Create a comprehensive process map.** Map out the current affordable housing development process in detail, including timelines and relevant public entities. The map should break out the particular considerations for preservation projects. With that map in place, the City should then produce a process document that can be shared externally with all partners, developers, and building owners.

4. **Streamline the development process for affordable housing.** Identify areas where consensus among relevant public entities can streamline processes through changes like combining funding applications and setting clear criteria for expediting certain development processes (i.e. building permits, zoning hearings, utility connections).

5. **Offer more (diverse) funding.** Align affordable housing preservation funding with higher-level City priorities. This should include an exploration of predevelopment and construction lending, and increased gap financing.

    a. Predevelopment financing is the riskiest stage to finance a project and is also where the scope and goals are determined. The more the City can support projects at the predevelopment stage, the more successful projects will be later in the development process.

    b. Make sure mission-led developers are provided with the support they need to continue serving the most vulnerable residents. The City's mission-led developers are keenly interested in supporting their residents. This focus also typically includes supporting the surrounding neighborhood.

6. **Provide affordable housing developer services.** Support developers throughout the process through the creation and staffing of an affordable housing developer services team at DPD.

    a. This approach made good sense to the workshop participants. As the City asks developers to do more to meet affordability and decarbonization goals, it should be ready to provide hands-on support throughout the process.

7. **Training.** Ensure that education and training opportunities reach everyone, including building managers, maintenance staff, and residents. This will ensure that decarbonization interventions are successful and sustainable. The process does not end with construction.

Nidhi Krishen shares the City's current efforts with a workshop breakout group.

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> Weatherize, weatherize, weatherize.
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> *–Nidhi Krishen*
>
> *Deputy Director for Climate Solutions, Office of Sustainability*

Next Steps

This workshop produced a host of ideas that will require further prioritization and sequencing. By starting with the process map, it may be possible to help the City highlight gaps and places where it might find early and impactful interventions. ULI Philadelphia looks forward to continuing these important conversations and helping the City support, encourage, and incentivize developers and building owners in their pursuit of affordable housing preservation and development that is aligned with the City's decarbonization goals.

Appendixes

Appendix A
Decarbonization Definitions

Sourced from ULI Chicago's report *Climate Ready Chicago: Strategies for Accelerating Building Decarbonization*.

Building Decarbonization

Activities and programs that reduce greenhouse gas emissions (GHGs) from buildings, related to operational and embodied carbon.

Operational Carbon

Emissions related to building operations, arising from refrigerant leakage and energy sources such as natural gas used in cooling, heating, lighting, and powering buildings. Operational carbon can be minimized by reducing energy usage in buildings and switching from gas fired to electrical equipment powered by electricity generated from carbon-free sources such as solar.

Embodied Carbon

Emissions arising from the manufacturing and transportation of building materials and the building construction process. Embodied carbon is locked into the building itself, and the best way to reduce embodied carbon is to reuse existing buildings or when renovating or building new, to select low-carbon materials.

Carbon Offsets

A reduction in carbon emissions or increase in carbon capture and storage through activities like planting trees to compensate for emissions that occur elsewhere. The offsets are based on the concept that because GHGs mix globally in the atmosphere, it does not matter where they are reduced. Therefore, when it is difficult or expensive to reduce their own carbon emissions, organizations or individuals can purchase carbon offset credits and claim the underlying reduction towards their own emissions reduction goals. A carbon offset credit represents an emission reduction of one metric ton of CO2, or an equivalent amount of other GHGs. Carbon offsets can be controversial because they are difficult to regulate and can be used by entities to avoid implementing carbon reduction measures in their own operations.

Equitable Development

A form of planning and community development that can make communities of low- and moderate-income and minority people into places that provide economic opportunities, affordable living, and cultural expression for all residents. The environmental, economic, and social benefits of accelerating decarbonization should be realized by residents and building owners across the region, including owners and tenants of smaller buildings, who are often less-resourced.

Net Zero Carbon

Within the real estate industry, net zero carbon refers to highly energy efficient buildings that are fully powered by carbon-free energy sources such that their annual and life-cycle carbon emissions are either zero or negative. As illustrated in "ULI's Real Estate Journey to Net Zero," building owners need to take several steps to achieve net zero carbon. Two key components of the journey include energy efficiency and building electrification. Energy-efficiency measures, such as insulating the building exterior to minimize heat gain/loss and matching the heating and cooling schedule to the building's occupancy, reduce the amount of energy used to operate the building. Building electrification or replacing gas-fired equipment when it reaches the end of its useful life with electric equipment, can further reduce, or eliminate carbon emissions. Additional details on achieving net zero carbon buildings are presented in the recommendations section of the report.

Renewable Energy

Energy generated from sources that can be replenished such as wind, water, solar, and geothermal energy. Electricity generated from these renewable sources does not create direct greenhouse gas emissions.

Renewable Energy Certificates (RECs)

Also known as renewable energy credits, RECs allow consumers to ensure that the electricity supplied to a home or business is coming from a renewable source. A REC is issued when one megawatt-hour (MWH) of electricity is generated from a renewable energy source and delivered to the grid. Because electricity supplied by the grid typically does not include any information on where and how it was generated, it is difficult, if not impossible, for an entity to estimate carbon emissions associated with their electricity consumption. Until the grid is carbon-free, purchasing RECs allows entities to eliminate carbon emissions associated with the production of electricity consumed for their operations.

Scope 1, 2, and 3 Emissions

Greenhouse gas (GHG) emissions inventory for an organization is a list of different emissions sources and the quantity of emissions associated with each source. Based on key characteristics of emissions sources, such as the level of control by the organization, the Greenhouse Gas (GHG) Protocol organizes sources into three categories, or scopes. This categorization is intended to make it easier for organizations to identify emissions reduction opportunities throughout their operations.

- Scope 1: Also called direct emissions, these are emissions from sources that the organization owns or controls. This includes emissions from natural gas-fired heating and hot water systems in buildings.
- Scope 2: Emissions that are a consequence of the operations of the organization but occur at sources owned or controlled by someone else are called Scope 2 or indirect emissions. This includes GHG emissions from the generation of electricity purchased by the company to run its building operations.
- Scope 3: Scope 3 emissions include all other indirect emissions not covered in Scope 1 or 2. These can be the most difficult emissions to measure and reduce. In the context of real estate, Scope 3 emissions can arise from the manufacturing and transporting of building materials during a construction/renovation project. Emissions from tenant spaces that are not controlled by the building owner would also be considered Scope 3 emissions.

Whole Life Carbon

The combined total of embodied and operational emissions over the life cycle of a building, from material sourcing, manufacture, construction, use over a given period, to demolition and disposal, including transport emissions and waste disposal.

Appendix B

Workshop Participants

Vidhi Anderson
VP of Development
HumanGood
Philadelphia, PA

As Vice President of Development for HumanGood, Ms. Anderson and her team focus on advancing HumanGood's affordable housing development and preservation initiatives on the east coast. With more than 20 years of experience, she is recognized for her advocacy in developing new affordable housing communities for older adults who need secure homes in the greater Philadelphia region. She is a board member of several organizations including the Philadelphia Housing Development Corporation, Regional Housing Legal Services, PA Developer Council and Women in Housing and Finance (PA). HumanGood is the seventh-largest nonprofit senior living provider in the country and owns 100 affordable housing communities across five states (California, Delaware, Oregon, Pennsylvania and Washington) with more than 8,880 residents.

Joe Backer
Senior Development Officer
Mayor's Office of Housing
Boston, MA

Joe Backer is a Senior Development Officer for the Mayor's Office of Housing in Boston, working to support the creation and preservation of affordable housing in neighborhoods across the city. This includes a long-standing partnership with Boston's Department of Energy and Environment to craft new programs spurring decarbonization and deep energy retrofits in Boston's existing affordable housing, from the iconic triple-decker to large multifamily residential buildings.

Joe works with many different housing and community development partner organizations to advance affordable housing projects that help create safe and affordable homes for Bostonians. Prior to joining the Mayor's Office of Housing, he received his Masters in Public Policy from the Harvard Kennedy School of Government, during which time he worked as a Fellow with the City's Housing Innovation Lab and focused on a cross-departmental initiative to develop badly-needed affordable housing on top of City assets like libraries and fire stations.

Neil Burger
Program Manager, Capital Projects Division
PHA
Philadelphia, PA

Neil Burger is the Program Manager in PHA's Capital Projects Division. Neil has been with PHA since 2023, with prior experience working in construction and finance. His primary duties include the low income housing tax credit (LIHTC) projects that PHA utilizes to build and renovate new and existing developments across Philadelphia, raising funds via grants, and sourcing properties and development partners for PHA to work with. He has a B.S. in Finance from the University of Dayton and is pursuing a masters in Construction Management at Purdue.

Kelly Cary
Senior Development Project Manager
Stone Sherick
Philadelphia, PA

Kelly holds a Bachelor's degree from the University of Pittsburgh majoring in Urban Studies and Legal Studies. She joined the Stone Sherick team in 2023 after completing her Master's in City Planning degree at UPenn, targeting affordable housing policy and development. Kelly also interned throughout graduate school with local organizations focused on housing, community, and economic development. Previously, Kelly spent 5 years at the Urban Land Institute Philadelphia running community impact programs that promoted equitable development practices and brought accessible real estate and land use planning education to minority developers, public officials, and community leaders.

Mark Dodds
Interim Deputy Director
Division of Housing and Community Development
Philadelphia, PA

Mark Dodds is the Interim Deputy Director for the City of Philadelphia's Division of Housing and Community Development. He is responsible for overseeing daily operations, including directing the development and implementation of affordable housing programs and services. Mark looks to harness the power of data and spatial analysis to make informed decisions. His work involves extensive engagement and collaboration with partner organizations and community members to ensure programs are effective and goals are met.

Jaclyn Helverson
Treasurer
PHA
Philadelphia, PA

Jaclyn Helverson is a graduate of Kutztown University with a Bachelor of Science in Business Administration with a concentration in Accounting. Jaclyn has been with PHA for 12 years, starting as a Treasury Specialist in the Finance Department and progressing through PHA now in her current position as Treasurer, where she has been since 2017. In her current role, she is responsible for preparing and monitoring weekly and monthly cash forecasts to determine cash needs of the Housing Authority.

Laura S. Humphrey
Senior Director of Energy & Sustainability
L+M Development Partners
New York, NY

Laura Spencer Humphrey is the Senior Director of Sustainability at L+M Development Partners - an impact driven, vertically integrated developer, builder, and manager of multifamily, mixed use, and affordable housing. At L+M, Laura leads the company's effort to build better communities with an innovative and climate-forward perspective. She draws from her experience as a former decarbonization consultant who advised Fortune 500 companies on planning for a cleaner future. In advancing L+M's sustainability efforts and energy and data practices, Humphrey created a department that combines best industry practices with her professional acumen to ensure that L+M continues to be a leader in sustainable development. Her department works across the building life cycle to improve energy efficiency, increase the adoption of distributed energy resources, and set the company's carbon strategy.

Laura has over a decade of experience leading strategies to realize energy and carbon goals in the built environment at the organizational and regional level. Prior to L+M, she spearheaded the development of decarbonization strategies for private sector clients at ENGIE Impact and directed energy initiatives at the state, city, and utility service territory level in roles at ICF and NYSERDA.

Nidhi Krishen
Deputy Director for Climate Solutions
Office of Sustainability
Philadelphia, PA

Nidhi serves as the Deputy Director, Climate Solutions at the Office of Sustainability at the City of Philadelphia. The Climate Solutions team supports the development and implementation of policies and plans to support Philadelphia's equitable clean energy transition. Supporter of a thoughtful, strategic, ambitious and equitable approach to climate action, Krishen leads the Climate Solutions team in providing technical and policy research, analysis and assistance on Philadelphia's clean energy transition, developing and implementing strategies and plans and convening and engaging with partners and stakeholders across the city's energy ecosystem.

Prior to joining the Office of Sustainability in 2021, Krishen worked as a global sustainability consultant in the private sector, advising large, multi-nationals on improving their ESG performance. Krishen holds a Masters in Environmental Studies from the University of Pennsylvania, with a focus on Sustainability.

Saundra Malanowicz
Program Manager
Division of Housing and Community Development
City of Philadelphia
Philadelphia, PA

Saundra Malanowicz is a Program Manager in the Division of Housing and Community Development (DHCD) for the City of Philadelphia. At DHCD, Saundra works on affordable housing program planning, design, and evaluation, and is responsible for several applications and reports for federal and local funding sources. Prior to joining the City of Philadelphia, Saundra worked for the New York City Department of Citywide Administrative Services real estate services group, coordinating with City agencies on land use and site selection needs, and earned a Masters of Urban Planning degree at Hunter College.

Naida Elena Montes, Ph.D.
CDBG-DR Deputy Project Director
Office of the Director of Finance
City of Philadelphia
Philadelphia, PA

Naida Elena Montes is the CDBG-Disaster Recovery Deputy Project Director at the Office of the Director of Finance for the City of Philadelphia. She is a Native of North Philadelphia and began her career in Community Development at the Asociación de Puertorriqueños en Marcha (APM). Her years working at the Community Economic Development office at APM motivated her to seek more expertise and advance her knowledge as it relates to a wide range of housing, environmental, economic, and social issues resulting from social and political challenges in the urban landscape.

In August of 2023 Naida received her Ph.D. from the Department of Geography and Urban Studies (GUS) at Temple University. Her academic research examined the theoretical and historical connections between urban landscapes, health, and socially constructed environmental inequities relating to histories of marginalization and discrimination. Using community-engaged research, her work sought to amplify residents' voices, keeping the residents' human experience at the center of knowledge production while establishing the home as a critical scale of analysis intimately connected to health, well-being, and environmental injustice in cities.

Stacey Mosley
Senior Director, Development & Research
Brandywine Realty Trust
Philadelphia, PA

Stacey Mosley is the Senior Director of Development & Research at Brandywine Realty Trust, leading a variety of development projects in addition to data driven acquisition analyses, oversight of the organization's Neighborhood Engagement Initiatives, and development of strategies to take on emerging industry trends.

After studying Manufacturing & Design Engineering at Northwestern University, Stacey applied her interest in products and process at the City of Philadelphia working on both the Vacant Property Strategy and Open Data Initiative before starting her own proptech company, Stepwise, and pursuing investment and development projects.

Stacey is a board member of the Economy League of Greater Philadelphia, the co-chair of the Community & Economic Development Council at the Philadelphia Chapter of the Urban Land Institute, a member of NAIOP's national Visionaries program, and a recurring speaker at Drexel University, Temple University, and the University of Pennsylvania for courses in Urban Planning and Spatial Analysis.

Rachel Mulbry
Director of Policy and Strategic Initiatives
PHDC
Philadelphia, PA

Rachel Mulbry is the Director of Policy and Strategic Initiatives at the Philadelphia Housing Development Corporation (PHDC), the non-profit arm of the City's Department of Planning and Development. Rachel's portfolio of housing programs includes two residential repair loan programs – one for homeowners and one for small landlords – and two rental assistance programs, including the City of Philadelphia's first guaranteed income pilot, PHLHousing+. She previously helped lead Philadelphia's nationally recognized Covid-19 emergency rental assistance program. Prior to joining PHDC, she worked in the climate adaptation and environmental justice field at several non-profit organizations, including the Nature Conservancy and World Resources Institute. Rachel has a bachelor's degree from McGill University in Montreal and a Master of City Planning from the University of Pennsylvania.

Andrew Niemynski
Residential Program Manager
Philadelphia Energy Authority
Philadelphia, PA

Andrew Niemynski is the Program Manager for the Philadelphia Energy Authority's Built to Last program. This program provides necessary home repairs to low and moderate income homeowners in Philadelphia. Andrew coordinates repair services between multiple agencies to have the maximum impact to each home.

Prior to this role he served as the Housing Coordinator for HIAS PA assisting refugees in their housing needs as they arrived in Philadelphia. Over a two and a half year span, Andrew found safe and affordable housing for nearly 700 refugees. Andrew has also done community development work in South Philadelphia and Baltimore where he moved after college. In 2019 he graduated from the University of Pittsburgh with a degree in Urban Studies.

Andrew is passionate about housing, public transportation, and immigration issues. Andrew is second-generation Polish-American from the Philadelphia area and is excited to serve the city that gave his family the opportunity for a better life.

Kenyatta "Ken" Parker
Energy Program Manager
Community Investment Corporation
Chicago, IL

Ken Parker is the current Energy Programs Manager at Community Investment Corporation (CIC). Ken oversees quality control for grant deliverables that provide energy efficiency and climate resiliency services to CIC borrowers. Ken uses his vast experiences and wealth of knowledge in housing issues and community awareness to steer his 23-year career in not-for-profits agencies and his 10 years in employment serving disadvantage communities.

Prior to his role at CIC, Ken was the Multi-Family Project Supervisor, Assessor and Final Inspector for Community Economic Development Association (CEDA). Ken has also worked with the Chicago Bungalow Association and Franklin Energy as an Energy Advisor.

Alan Razak
Senior Advisor
AR Spruce
Philadelphia, PA

Alan Razak co-founded AR Spruce LLC and now serves as a senior advisor to the firm. Alan's background in commercial real estate encompasses development and project management, finance, architecture, and feasibility/planning analyses. He has extensive experience managing the development process, both as owner and as a fee developer, and has experience with use types including residential, office, and retail, as well as specialized expertise with highly technical facilities such as data centers.

Alan founded Razak Company in 2003, where he developed projects such as Pembroke North Condominium, Main Line Jaguar Land Rover, 5035 Ritter Road for the Administrative Office of PA Courts, and the Curtis Institute of Music's Lenfest Hall, where he restarted an over- budget project and saved $12 million. He provided early-phase planning or forensic analyses for projects at Swarthmore College, Citadel Investments, the Rock School of Dance, and Vanguard.

Susanne Stone
Principal
Stone Sherick
Philadelphia, PA

Susanne received her Bachelor's Degree at Kutztown University and her Master's Degree in social administration and public policy at Temple University. Susanne has over 30 years experience in social services and real estate development, formerly having served as the Director of Housing for Project HOME and the Director of Constituent Services for Councilwoman Happy Fernandez. Susanne specializes in service-enriched housing for seniors, the homeless, veterans and special needs populations and works with clients from concept to completion on all aspects of the development process. Susanne established Stone Sherick Consulting Group, LLC. in 2013, a certified women owned business (WBE) in PA.

David S. Thomas
CEO
PHDC
Philadelphia, PA

David S. Thomas is the CEO of PHDC. PHDC is Philadelphia's full-service community development organization, providing financing for the preservation and creation of affordable housing. PHDC's programs provide critical repairs and modifications for homeowners allowing families to remain safe and healthy in their homes. PHDC's other programs and land services assist and facilitate community groups, businesses and developers with re-purposing vacant land, as well as makes critical investments in every neighborhood in the City of Philadelphia.

In 2019, Mr. Thomas led the revisioning of the staff and mission for the Philadelphia Housing Development Corporation, Philadelphia Redevelopment Authority, and the Philadelphia Land Bank to consolidate to create PHDC. This consolidation was necessary to increase transparency and efficiency amongst the quasi-city agencies. These agencies still have individual boards and powers to execute specific functions, but the vision is the same—to make Philadelphia better block by block. PHDC executes its vision through three lines of service: home improvement programs (HIP), community investment, and land management. Each component works together to change our city for the better. PHDC works closely with the City's Department of Planning and Development (DPD).

Mr. Thomas is a graduate of Lincoln University with a B.A. in Accounting with a minor concentration in Psychology

Derrick Tillman
Founder and President
Bridging the Gap
Development
Pittsburgh, PA

Bridging the Gap Development, LLC ("BTG"), founded in 2006, is a real estate development firm based in Pittsburgh, PA. Mr. Derrick L. Tillman, Founder and President of BTG, leads the company's mission to build sustainable communities through residential & commercial development. In order to achieve this goal, BTG develops a variety of development projects including mixed-income multifamily housing, mixed-use development, and public private partnerships. A few notable projects currently in process include a mixed-income development in Pittsburgh which includes 103 units of multifamily housing and an adaptive reuse project to convert a former elementary school to 45 units of mixed income housing. Additionally, Tillman is a licensed broker in the State of PA and owner of Tillman Realty Group (TRG) and has been in the real estate industry for over 20 years. Finally, Tillman is married to his beautiful wife Nykia of 16 years and together they have three children.

Joel Wool
Deputy Administrator
Boston Housing Authority
Boston, MA

Joel Wool is an affordable housing and energy professional with experience in local, state and federal policy and program implementation. He currently serves as Deputy Administrator for Sustainability and Capital Transformation for the Boston Housing Authority, where he is responsible for overseeing the BHA's plans for investment in, and emissions reductions from, nearly 10,000 units of public housing. Prior to his role at the BHA, Joel worked for the City of Boston and for both local and national environmental organizations. He holds a Masters in Urban and Environmental Policy and Planning from Tufts University.

Evelyn "Evy" Zwiebach
Director of Policy and Programs, Detroit Enterprise Community Partners
Detroit, MI

Evelyn (Evy) Zwiebach is a seasoned planner, policy analyst, and program manager with 15 years of experience advancing equitable communities. As Director with Enterprise Community Partners in Detroit, Evy leads initiatives that promote affordable housing production and preservation, tenant protections, and access to affordable homeownership. She is co-author of a policy brief on land contract reform and a Land Contract Buyer guide for City of Detroit residents. She also oversees the Detroit Home Repair Fund, which provides low-income Detroit homeowners with critical health and safety repairs, paired with energy improvements.

Prior to joining Enterprise, Evy was a planner with the Chicago Metropolitan Agency for Planning where she led neighborhood and municipal planning processes and helped develop the Agency's regional plan. Evy also previously worked as Assistant Project Manager at Telesis Corporation, an affordable and mixed-income housing development company, and as a paralegal at New York Legal Assistance Group.

Evy earned her Master in Urban Planning from Harvard Graduate School of Design and her Bachelor of Arts from Harvard College. Evy currently serves on the boards of Sinai-Grace Guild CDC and the Coalition for Home Repair.