

2025

# Penciling Out

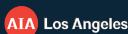
Financing Solutions for Affordable &  
Climate Forward Housing

*Outcomes & Ideas*



Projects: The Kenzi (@ Jane Messinger), Melrose North (@ Alexander Severin), Pacific Landing (@ Pavel Bendov Photography)

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# Table of Contents

Penciling Out	4
Introduction	5
Boston, Massachusetts	6
New York	9
Los Angeles, California	12
Call to Action	14
Resources	19

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## Penciling Out: Financing Solutions for Affordable & Climate Forward Housing

Supportive senior housing, transit-oriented mixed-income communities, all-electric apartment buildings—these are the contemporary forms of affordable housing taking shape across American cities, designed to serve diverse populations while responding to climate imperatives and financial pressures. Despite ambitious sustainability targets and urgent housing needs, many architects and developers find it difficult to “pencil out” projects that are both equitable, affordable, and energy-efficient.

In response, **Penciling Out** convened hundreds of practitioners, policymakers, advocates, and financiers from Boston, New York, Los Angeles, and beyond. Held weekly from April 30 to May 21, 2025, the five-part series was organized by the AIA’s three largest local chapters. Series’ attendees explored how housing projects—designed to meet both environmental and social benchmarks—can succeed within today’s financial and regulatory constraints.

This report documents the key findings, frameworks, and tools presented throughout the series. It includes case studies, tested capital stack models, and region-specific strategies that challenge the narrative that high-performance, affordable housing is too costly or complex to realize. By surfacing real examples and actionable insights, Penciling Out aims to support design professionals and decision-makers in turning policy ambition into built outcomes.



# Introduction

## CONSTRAINTS OF HOUSING PRODUCTION

In Boston, New York, and Los Angeles—three of the most expensive and regulated housing markets in the country—the production of green, affordable housing is shaped by a web of interlocking constraints. These include some of the strictest energy codes, antiquated zoning laws, high construction and land costs, and onerous permitting processes. At the same time, each region faces the dual and urgent crises of housing affordability and climate change, making the stakes for building new housing higher than ever.

While these challenges are often cited as reasons why affordable housing can't meet high-performance standards, the *Penciling Out* series aimed to turn this narrative on its head. By examining case studies and financial strategies from each city, the series highlighted how smart policy, design leadership, and a growing landscape of federal and local incentives—from the Inflation Reduction Act's tax credits and rebates to new zoning bonuses and streamlined permitting directives—can help projects succeed, even within tight budgets and dense urban contexts.

Presenters also addressed a critical cultural barrier: the belief that high energy performance, quality design, and affordability are mutually exclusive. In contrast, *Penciling Out* emphasized that, when integrated from the start, climate strategies can reduce long-term operating costs, unlock capital, improve residents' health, and create more resilient communities.

**Webinar Kickoff:**  
[Event Recording](#)  
[Presentation Slides](#)

Through shared frameworks and practical tools, *Penciling Out* offered an alternative path—one where design excellence, sustainability, and affordability are fundamentally intertwined.

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# Boston, Massachusetts

## The Context

Massachusetts is confronting two intertwined crises—housing affordability and climate change—with a target to build **222,000 new all-electric, affordable housing units** over the next 35 years. The state has made major strides, including the launch of the nation's first green bank dedicated to affordable housing and climate goals. To guide the design community's role in this effort, in 2024, the BSA has released its first two advocacy platforms—on [climate](#) and [housing](#)—outlining actionable policy priorities for a more equitable and sustainable built environment.

## Mass Save

Mass Save is a statewide collaboration of Massachusetts utility providers that delivers energy efficiency and sustainability programs to residents and businesses, aiming to reduce greenhouse gas emissions and offset the costs of high-performance building through low-cost upgrades and incentives. Since 2020, Mass Save's new construction programs have been entirely performance-based, aiming to reduce energy use intensity (EUI) and promote electrification through technologies like air-source heat pumps, Passive House design, and networked geothermal systems. As of 2025, all participating buildings must be all-electric—part of a broader shift driven by state climate legislation and evolving building codes, which has led Mass Save to end all fossil fuel incentives and require electrification as a program prerequisite. **Nick Jones**, Senior Energy Efficiency Consultant with Eversource spoke about Mass Save's tiered incentives for new construction and renovations for single-family and multifamily buildings. All-electric requirements apply across most tiers, with bonuses of up to \$40,000 per unit for Passive House under the Single-Family New Construction program and \$9,000 per unit for ground-source systems, plus additional subsidies for feasibility studies in multifamily projects and up to \$30,000 for deep energy retrofits and electrified additions.

**Boston Context:**  
[Event Recording](#)  
[Presentation Slides](#)

# Boston, Massachusetts

## Continued

### MassHousing

**Chris Burns** and **Thomas Burns, AIA**, presented about the state's affordable housing finance agency, MassHousing, created in 1966 to support low- and moderate-income homebuyers and developers through bond-financed loans, down payment assistance, and rental housing financing. It operates independently without taxpayer funding, while administering select public programs for the state. The presentation highlighted the agency's role in financing green, affordable housing across the state, particularly through its administration of the Massachusetts Community Climate Bank (MCCB)—a new initiative seeded with \$50 million to support decarbonization in the residential sector. The Climate Bank's first product, the Energy Saver Home Loan, and its pursuit of federal Greenhouse Gas Reduction Fund resources underscore its long-term vision for clean energy lending. Additionally, the Climate Ready Housing Program, launched in partnership with [EOHLC](#), [MHP](#), and [LISC](#), provides substantial per-unit grants (averaging \$40,000) for deep energy retrofits and zero-over-time housing. MassHousing is also helping administer the Affordable Housing Decarbonization Grant Program, targeting low- and moderate-income residents and aiming to build developer capacity, especially for smaller CDCs.

### Sustainable Investment Group

SIG's **Colin Milner** and **Monte Hilleman** highlighted several key tools for asset value creation, emphasizing both the importance of green premiums and the risks of stranded assets and brown discounts. The Investment Tax Credit (ITC) was noted as a major resource, offering up to generally a 30-50% tax credit for solar, geothermal, and energy storage projects, with no application limits. Additionally, the 179D tax deduction offers up to \$5.65 per square foot for improvements made to energy-efficient buildings, with the ability for tax-exempt entities like municipalities and schools to assign to the design team. The 45L credit for new multifamily construction, and Home Energy Rebates for electrification, further support both new and retrofit projects.

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# New York

## The Context

New York City is facing a housing crisis exacerbated by production not keeping pace with increasing demand from population and job growth, with housing increasing by 4% compared to 22% job growth in the same time period. The [supply shortage has resulted in a rental vacancy rate of 1.4%](#), far below the healthy housing market threshold of 7%. In a [study conducted by McKinsey & Company](#) on behalf of the Regional Plan Association (RPA) found a 540,000 housing unit shortage in the region, with the gap growing to 920,000 units by 2035. Housing costs are unaffordable for a significant number of households with almost 3 million New Yorkers spending more than 30% of their household income on housing costs and one in five households spending more than [50% of their household income on housing costs](#).

## NYC HPD

The New York City Department of Housing Preservation and Development (HPD), the largest municipal developer of affordable housing in the U.S., focuses on building and preserving housing through public-private partnerships—not public housing—while advancing ambitious climate and resiliency goals. **Jennifer Leone, AIA**, Chief Sustainability Officer at HPD, highlighted several programs, including the Joint Retrofit Electrification Pilot, funded by NYSERDA, which provided up to \$24,000 per unit and free technical assistance to electrify heating and hot water in 48 buildings serving over 1,400 households. Though now closed, the pilot informed HPD's current REDi program by generating case studies and best practices for decarbonization. HPD's design guidelines mandate all-electric systems, flood-resilient construction, solar (where feasible), and Local Law 97 compliance, and HPD's integrated funding and technical support help projects meet these standards. The agency also leverages offset funding, tax abatements, and RFPs to scale climate-forward housing solutions citywide. For example, REDi currently offers up to \$35,000 per unit for electrification of heating, hot water, and envelope upgrades in existing buildings.

**New York Context:**  
[Event Recording](#)  
[Presentation Slides](#)

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# New York

## Continued

### NYSERDA

The New York State Energy Research and Development Authority (NYSERDA) is a public benefit corporation leading New York’s clean energy transition through funding, technical assistance, and over 90 programs aimed at decarbonizing buildings, transportation, and infrastructure. At the event, **Vera Voropaeva, AIA**, Project Manager at NYSERDA, presented an overview of the agency’s multifamily housing initiatives, focusing on bridging design ambition with available resources. NYSERDA’s flagship Buildings of Excellence (BOE) program supports over 8,000 housing units—70% pursuing Passive House certification—with an emphasis on affordability, electrification, and resilience. Through Early Design Support (EDS) and Demonstration RFPs, it offers up to \$150,000 per project, collects real-world performance data, and drives innovation in disadvantaged communities, where 87% of recent funding was directed.

### Case Study: CVA



**Sara Bayer, AIA**, Associate Principal and Director of Sustainability at Magnusson Architecture and Planning, presented a case study on the 28-story, 211-unit affordable senior housing project, Carmen Villegas Apartments (CVA), in Harlem, highlighting its high-performance, climate-forward design. With funding from NYSERDA’s Buildings of Excellence program, the project used early design support to analyze the cost-benefit of Passive House certification, geothermal systems, and on-site solar, revealing that Passive House added only 1.5% to construction costs while delivering operational savings and resilience. The geothermal system, supported by federal tax credits, kept the building fully electric and grid-beneficial, while solar panels (covering ~15% of electricity needs) offered an 11.8-year payback. This process created replicable tools to support sustainability decisions across future projects, showing how early-phase support and strategic design can balance financial and environmental goals.

Carmen Villegas Apartments (CVA), image courtesy of MAP.

# Los Angeles, California

## The Context

In Los Angeles, architects and developers are working against the backdrop of high construction costs—affordable housing costs 21% more to build than market-rate units, with the median reaching \$600,000 per unit. Permitting has sharply declined, from over 15,000 units in 2022 to just over 5,200 in 2024, while pre-development can take two years or more. To address these delays, Mayor Karen Bass issued Executive Directive 1 (ED1) in December 2022 to fast-track 100% affordable housing projects, with new limits on geography and incentives and a required public dashboard to improve transparency. An update in July 2023 narrowed eligibility, limiting projects in sensitive areas and capping incentives, while requiring a public dashboard to bring transparency and urgency to a process long mired in red tape.

## Case Study: Pacific Landing

**Tara Barauskas** from the Community Corp of Santa Monica introduced their work developing affordable, sustainable housing in high-opportunity areas like Santa Monica and LA's Westside. She emphasized their focus on long-term, family-oriented housing with stable rents tied to income—ranging from \$450 to \$1,500/month—serving workers like retail staff, bus drivers, and teachers. The organization designs for durability, community connection, and environmental sustainability, including building all-electric and modular projects, while also offering resident services like wellness programs, after-school care, and gardening. Tara highlighted their expansion beyond Santa Monica and previewed Pacific Landing, a new project that exemplifies these values. **Patrick Tighe, FAIA** followed up, describing the affordable housing project, Pacific Landing, located in Santa Monica, built on a former gas station site that once occupied the 14,160-square-foot corner lot. The development includes 37 residences, with a mix of one- and two-bedroom units, and emphasizes community spaces, particularly a central courtyard designed for social interaction, children's play, and gathering.

**LA Context:**  
[Event Recording](#)

# Los Angeles, California

## Continued



The building is LEED Platinum and net zero, with sustainable features such as solar photovoltaics, passive ventilation, and all-electric systems. The design incorporates subtle cuts in the massing to allow natural light and air, while also creating a sense of connection among residents. The project is a practical yet aesthetically elevated response to the dense urban setting, with materials like plaster and corrugated metal, and a high-resolution corner entry feature to make the building stand out. **Greg Switzer** from Parner Energy spoke about how the team exceeded compliance by achieving a building that performs 50.6% better than code, with an Energy Use Intensity (EUI) of 24.3 kBtu/sf, less than half the average for comparable multifamily buildings, under California's stringent 2016 Title 24 energy code and Santa Monica's Reach Code. Key strategies included passive design features like window fins and cross-ventilation, an all-electric infrastructure with electric heat pump water heaters, and Energy Star appliances. Technical upgrades such as fully insulated hot water lines, low-flow fixtures, reflective roofing, and low-wattage ventilation fans contributed to compounded energy savings. Additionally, stakeholder engagement and education—particularly for residents and building managers—were emphasized as essential for operational success. Financing these features remains complex, relying on a patchwork of incentives including LIHWIP, SoCalREN, BayREN, SGIP, ESA, and Build/TECH programs through the California Energy Commission. Tools like DSIRE (Database of State Incentives for Renewables & Efficiency) are crucial for identifying funding, as is expert partnership due to the fast-changing landscape of energy financing and policy.

Sustainable  
Investment Group

**Monte Hilleman** from SIG highlighted California's Home Energy Rebate (HEAR) Program, which offers up to \$14K per unit for electrification in households under 150% AMI.

*Pacific Landing, image courtesy of Tighe Architecture.*

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# ***Call To Action***



# Call To Action

## LOCAL

**AIANY 2025:**  
[Policy Platform](#)

**Los Angeles**  
**California**

**AIALA 2025:**  
[Policy Platform](#)

- **Reform environmental review procedures** to cut red tape and streamline process for infill development by establishing a clear, predictable review process.
- **Promote innovation for holistic carbon reduction** by rewarding creative design solutions to reduce embodied carbon and reimagine deconstruction, material reuse, and circularity.
- **Expand financial and technical support** for energy efficient retrofits to accelerate transition to decarbonize buildings to meet carbon reduction targets.
- **Expand adaptive reuse citywide and incentivize office-to-housing conversions** to consider the eligibility of all existing buildings for floor area incentives, regardless of historic status and reduce the rolling clock for the adaptive reuse program to expedite project financing and development.
- **Address the housing challenge with procedural reforms** like converting hotels or other buildings into temporary housing and adjusting ADA standards to make existing buildings more affordable. Streamline efforts with a public list of expiring covenants, city-owned land, and convertible hotels.
- **LA 2028 & Empowering Communities** by engaging the architecture and design community to develop inclusive, resilient urban design, interim housing, placemaking, and transportation alternatives. This expands LA28's legacy mission to benefit communities before, during, and after the Games by leveraging capital projects, maintaining sports facilities, and broadening Post-Games Surplus Distribution.
- **Lower Embodied Carbon in Our Built Environment** by setting embodied carbon thresholds for both products and buildings. This will help to incentivize the use of low-carbon materials and designs.

# Call To Action

## NATIONAL

At the national level, architects have a critical role in advocating for policies and programs that make sustainable, affordable housing both economically viable and widely implemented. To ensure these projects pencil out and move forward, architects should prioritize the following advocacy efforts:

### 1. **Expand and Modernize Federal Funding Programs**

Advocate for increased funding and modernization of programs such as:

- Low-Income Housing Tax Credit (LIHTC): Push for expansion and reforms (e.g., the Affordable Housing Credit Improvement Act) to make credits more accessible and better support mixed-income, energy-efficient developments.
- HOME Investment Partnerships Program and Community Development Block Grants (CDBG): Encourage continued or increased federal investment in these critical funding sources that support housing affordability and rehabilitation.
- Green retrofitting grants through HUD and DOE (like Weatherization Assistance Program or Green and Resilient Retrofit Program) should be expanded and simplified for multifamily housing.

### 2. **Tie Sustainability Requirements to Incentives**

Advocate for federal incentives (e.g., tax credits, grants, or loan guarantees) that specifically support green design and energy-efficient features in affordable housing. This includes:

- Expanding the Section 45L Energy Efficient Home Credit and Section 179D commercial building deduction.
- Advocate for ongoing protection of the IRA building and energy related incentives and for the expansion of the IRA's Investment Tax Credit by creating an "Energy Efficiency" ITC.

**AIA National:**  
[Public Policies](#)  
& [Positions](#)

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# Call To Action

## NATIONAL

- Supporting national adoption of green building standards (e.g., Enterprise Green Communities, LEED, or Passive House) in federally funded projects, with financial support to offset cost premiums.

### 3. **Support Policy That Streamlines Project Delivery**

Advocate for reducing regulatory barriers and streamlining federal approval processes for affordable housing projects, particularly those using blended financing.

Push for zoning reform incentives at the federal level—rewarding local governments that allow more density, mixed-use development, and reduced parking minimums through programs like HUD’s Pathways to Removing Obstacles to Housing (PRO Housing).

### 4. **Champion Workforce Development & Materials Access**

Support federal investment in green construction training programs (through DOL or community colleges) to build a skilled labor force capable of executing sustainable designs cost-effectively. Promote national incentives for domestic manufacturing and procurement of sustainable building materials to reduce costs and supply chain disruptions.

### 5. **Advocate for Equity-Centered Design Policies**

Encourage HUD and DOE to prioritize equity in sustainability funding so disadvantaged communities benefit first, and support standards for healthy materials, air quality, and climate resilience in affordable housing.

**By using your technical expertise and professional credibility** as design professionals, you can shape legislation by influencing funding priorities, and ensuring national policies are aligned with both sustainability goals and the economic realities of affordable housing development.

# ***Resources***

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# Resources

## BOSTON MASSACHUSETTS

### [City of Boston Office to Residential Conversion](#)

**Incentives:** Establishes pilot program reducing the residential tax rate up to 75% for up to 29 years with affordable housing requirements.

### [Mass Save Residential New Construction Program:](#)

Offers financial and technical support for high-efficiency, all-electric single family and low rise multifamily projects.

**Mass Save Passive House Incentive Program:** Offers financial and technical support for multifamily buildings that enroll in the early design phase pursuing Passive House certification.

### [DOER's Affordable Housing Decarbonization Grant](#)

**Program:** Provides grants for affordable housing projects for energy efficiency retrofits, solar installation, building electrification, and roof and electrical upgrades.

### [City of Boston HomeWorks Green Loan Program:](#)

Provides interest free, deferred payment loans for homeowners to cover energy efficiency retrofits.

### [MassHousing Climate Ready Housing Program:](#)

Finances energy retrofits in existing multifamily housing via a competition program covering the incremental costs of the retrofits, analysis and design services, and climate resiliency assessments.

**MHP Green Building Certification Financing:** Offers several financial incentives for new and existing multifamily properties that have been awarded a green building certification.

**MHP Green Retrofit Financing:** Offers grants or low interest financing for multifamily projects to cover soft costs associated with green certification to promote high-performance building standards and clean construction.

# Resources

## NEW YORK NEW YORK

[Green Fast Track for Housing](#): Streamlines the process for climate-friendly housing by up to 24 months and save each project approximately \$100,000.

[Affordable New York Program \(421-a\)](#): Provides a tax abatement allowing developers to pay taxes on land value pre-development.

[Affordable Neighborhoods for New Yorkers Program \(485-x\)](#): Replaces the Affordable New York Program to incentivize the creation of mixed-income housing with permanently affordable units and applies to rental and homeownership projects.

[J-51 Program](#): Provides tax exemptions and abatements for residential building owners to make capital improvement to reduce the building's carbon emissions.

[The Affordable Housing from Commercial Conversion Tax Incentive Benefits Program \(467-m\)](#): Establishes a tax incentive for office to residential conversion rental housing projects with affordable units, which are particularly difficult to pencil out without government incentives or subsidies.

[NYSDERDA Buildings of Excellence: Demonstration & Early Design Support](#): Provides competitive funding for low-carbon multifamily projects in early design and demonstration phases to spur innovation and accelerate building decarbonization.

[Affordable Housing Reinvestment Fund \(LL97 Offsets\)](#): Creates a fund for affordable housing electrification and efficiency projects, financed by offset purchases under Local Law 97.

[REDi: The Resilient & Equitable Decarbonization Initiative](#): Supports affordable housing projects with financial and technical support to decarbonize, focused on electrification, building envelopes, and resiliency improvements.

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# Resources

[City of Yes for Housing Opportunity](#): Reforms the city's antiquated zoning code from the 1960s to create opportunities to build 80,000 new housing units over the next 15 years by lifting parking mandates, enabling office conversions, density bonuses for affordable housing, legalizing transit oriented development and town center zoning, and eliminating key barriers with infill development.

[City of Yes for Carbon Neutrality](#): Amends the city's zoning code to unlock opportunities to increase and improve green infrastructure and remove barriers to building a sustainable energy grid, supporting environmentally sensitive building retrofits, encouraging a larger network of EV charging stations, and reducing waste and improving stormwater resilience.

## LOS ANGELES CALIFORNIA

[Affordable Housing and Sustainable Communities Program](#): Provides funding for affordable housing projects which include sustainable transportation infrastructure through the dollars generated from the statewide cap and trade program.

[United to House LA](#): Sets real estate transfer tax on high-value property sales to generate dedicated funding for affordable housing development programs. *Although ULA provides a funding source for affordable housing, [a recent study](#) shows it has made housing production more expensive.*

[Citywide Housing Incentive Program](#): Offers incentives for affordable housing development with density bonuses, reduced parking requirements, transit oriented development, increased FAR and height, and streamlined approval process

[Transit Oriented Communities Incentive Program](#): Provides density bonuses and other incentive for projects that include affordable housing units within ½ mile of major transit stops

# Resources

## FEDERAL

**Investment Tax Credit (ITC):** The Investment Tax Credit (ITC) is a federal incentive that offers a dollar-for-dollar income tax reduction for installing clean energy systems like solar, geothermal, or battery storage.

**[45L Tax Credit:](#)** The 45L Tax Credit is a federal incentive that provides up to \$5,000 per unit to builders or developers of new or substantially renovated energy-efficient residential buildings, helping reduce upfront costs and promote clean energy building standards.

**[Low-Income Housing Tax Credit:](#)** The LIHTC is a federal tax credit that incentivizes private developers to build or rehab affordable housing by reducing tax liability over 10 years, with rent and income limits for at least 15 years.

**[Home Electrification and Appliance Rebates \(HEAR\):](#)** Provides rebates of up to \$14,000 per household for switching to electric appliances.

**[Home Efficiency Rebates \(HOMES\):](#)** Provides rebates of up to \$8,000 for comprehensive home energy upgrades.

**[25C Energy Efficient Home Improvement Credit:](#)** Provides tax credit of up to \$3,200 per year for energy efficient upgrades (insulation, windows, heat pumps).

**[25D Residential Clean Energy Credit:](#)** Provides a 30% credit for solar, battery storage, geothermal, and wind systems.

**[45L New Energy Efficient Home Credit:](#)** Provides tax credit of up to \$5,000 per unit for developers of ENERGY STAR or Zero Energy Ready homes.

**[179D Commercial Buildings Deduction:](#)** Provides a tax deduction of up to \$5 per sqft for energy efficiency improvements of multifamily buildings.

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