GREEN FINANCE INNOVATION: HOW MORTGAGE LENDERS CAN DRIVE NYC BUILDING DECARBONIZATION

A WORKING WHITEPAPER

By Marianna Koval and Tensie Whelan
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About NYU Stern Center for Sustainable Business

The NYU Stern Center for Sustainable Business (CSB) was founded on the principle that sustainable business is good business. We provide education, conduct research, and influence industry practice by proving the financial value of sustainability for business management and performance. At CSB, we aim to equip future and current corporate leaders with updated business frameworks that embrace proactive and innovative mainstreaming of sustainability, resulting in competitive advantage and resiliency for their companies as well as positive impact for society.

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Introduction

Climate change presents unprecedented financial risks to business and society, but also offers opportunities for those willing to lead the transition to a sustainable, low-carbon world.

Carbon emissions from fossil fuels are the largest contributors to climate change globally, but the activities that generate these emissions vary and require different solutions.

In New York City, the largest sources of carbon emissions are our buildings. The City is working to reduce those carbon emissions through local laws 97 and 96 and other measures, but these interventions alone will prove insufficient. There is no meaningful investment in the privately owned built environment without financing. Looking forward, building owners and operators will depend increasingly on banks and other lenders to expand the range of green financing products.

This paper is intended to spark conversation and further research into practical solutions for building decarbonization finance in New York City, across the United States, and around the world. Progress is being made in linking building decarbonization goals to financing alternatives, but billions of dollars in investment are still needed to undertake green building retrofit projects.

To explore ways to close the financing gap, NYU Stern and the New York City Economic Development Corporation (NYC EDC) have convened a building decarbonization finance taskforce of lenders, building owners, and policymakers. Over the coming months, the task force will generate a series of practical recommendations for how to advance green mortgages and other retrofit financing. This paper helped to shape the goals of the task force, and we hope to incorporate the learnings from the task force into this work.
The NYU Stern Chao-Hon Chen Institute for Global Real Estate Finance is privileged to collaborate with the NYU Stern Center for Sustainable Business on this research, the building decarbonization finance task force, and the Decarbonization Compass – a data tool that will offer essential support in unlocking financing for building decarbonization – to support a more sustainable, inclusive, and resilient urban economy in New York City.

Dr. Sam Chandan, Founding Director of the C. H. Chen Institute for Global Real Estate Finance, NYU Stern School of Business, and Co-Chair of the NYU Stern & NYCEDC Building Decarbonization and Climate Finance Task Force
Executive Summary

Climate change is moving the world toward global catastrophe. We need to act quickly to finance the solutions to cut carbon emissions and adapt to climate impacts. While the climate crisis presents major financial risks to business and society, it also offers opportunities for those willing to lead the transition to a sustainable, low carbon world. This is especially true in decarbonizing the dense built environments of our cities. A key player is the mortgage banking industry due its ability to provide green mortgages and other financing mechanisms. This white paper attempts to lay out some of those risks and opportunities for the mortgage banking industry in New York City and is the result of four years of research and discussions with major stakeholders looking for solutions to support and finance building decarbonization. Our goal is to share concrete steps that the mortgage banking industry and climate financiers may undertake to lead real estate decarbonization in NYC, and create a model for the nation.

The context:

- In New York City, buildings are by far the largest source of carbon emissions – nearly 70%. The City is committed to a net-zero carbon profile by 2050, which makes it essential to shrink the carbon footprint of the city’s approximately one million buildings.

- In 2019, the City enacted Local Law 97 (LL97), a major initiative under the Climate Mobilization Act, that requires owners of large buildings to decarbonize their holdings or face penalties. The law applies to roughly 50,000 buildings, which contribute more than 50% of all building emissions in NYC. LL97 is a significant step in the right direction, but it alone will not accomplish New York’s ambitious carbon goals.

- Some real estate owners have committed to sustainability goals and are actively working to decarbonize their properties. Along with building owners, many other stakeholders in the real estate market, such as banks, mortgage lenders, regulatory agencies, and investors, can push for decarbonization. Many, aware of the growing impacts of climate change, are already doing so.
Here, and in other countries, many corporations are committing to net zero goals, and investors and regulators are pressing companies for disclosure of carbon emissions, including Scope 3 or “financed” emissions. Starting in 2027, California will require mandatory Scope 3 reporting for companies and organizations with over $1 billion in revenues pursuant to the newly enacted Climate Corporate Data Accountability Act. And New York State has similar legislation currently pending.

New York’s largest banks and mortgage lenders have an opportunity to play a pivotal role in reducing the carbon footprint of their city and providing green financing to their customers for decarbonization, while enhancing their own portfolios and reducing their own Scope 3 carbon emissions.

Growing evidence demonstrates that green buildings are lower-risk investments, commanding higher valuations, costing less to run and reducing defaults, and providing greater resiliency to the depreciation rate of energy inefficient buildings.

NYU Stern Center for Sustainable Business has built the Decarbonization Compass to help prioritize action. The data tool identifies the mortgage holders of LL97-covered buildings, allowing a user to see the top individual and aggregate carbon emissions in a lender’s portfolio. It also allows building owners to see their total emissions, their energy rating, and the fines they may be subject to based on their current emissions.

The banking industry in the European Union and the UK provide models for the US to build upon. Through a range of green financing mechanisms, including mid-cycle commercial property assessed clean energy (C-PACE) lending and, importantly, a variety of green mortgage products, lenders can collaborate with building owners to provide strategic financing for energy-efficient retrofits and clean energy projects, making buildings in New York City greener and more profitable in the long term.

NYU Stern is partnering with NYC Economic Development Corporation (EDC) and NYC Mayor’s Office of Climate and Environmental Justice (MOCEJ) to convene the crucial stakeholders and further develop practical solutions to finance building decarbonization in NYC.
Why the Built Environment?

The World Green Building Council calculates that buildings are currently responsible for 39% of total global carbon emissions.¹

Approximately, 11% of total emissions are generated by manufacturing materials used in buildings (including steel and cement), while the remaining 28% are operational emissions from energy needed to heat, cool and power buildings.²

Figure 1: The Built Environment as a Percentage of Global CO2 Emissions

¹ This paper uses “GHG” and “carbon emissions” interchangeably. Carbon dioxide represents the vast majority of GHG, but other gasses like methane, for example, also emit GHG.
Eliminating CO2 emissions from buildings is essential to meeting the Paris Agreement target of limiting global warming to 2 degrees Celsius. The Agreement called on countries to ensure that all new buildings be net-zero carbon starting in 2030 and to achieve net-zero emissions in their built environments by 2050. One hundred and twenty countries have built those goals into their Nationally Determined Contributions (NDCs) and are working toward decarbonizing their built environments, though each country is responsible for creating and implementing its own goals.³

The US is lagging, however, on that score. Emissions from commercial and residential buildings are rising, not falling. Indeed, direct emissions from buildings rose by 6% in 2022 and it was the only sector to rebound to pre-pandemic levels.⁴ Rising emissions from high global warming potential (GWP) refrigerants are the main drivers of the building sector’s rising GHG emissions. Water heating, cooking, and clothes drying are also major contributors to the building sector’s emissions.

The building sector is the largest consumer of energy, accounting for 39 percent of total energy consumption and 75 percent of electricity use.⁵ The failure to reduce emissions, significantly improve energy efficiency, or speed the transition to electrification means the building sector is far off track to reach net-zero by 2050.

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⁵ Id.
NYC: A Unique Challenge and Opportunity

The dense built environment of New York City makes for an unusually large carbon footprint. The city’s one million buildings account for 70% of the city’s greenhouse gas emissions, far higher than the 39% global average. This is because of the abundance of buildings in NYC, the age and inefficiencies of those buildings (such as fossil-fuel based heating and water systems in pre-war residential buildings), and the fact that many buildings get their energy from a local grid that derives 85% of its power from fossil fuels. Furthermore, New York City’s robust public transit system significantly reduces the amount of greenhouse gas emissions generated by transportation, a percentage that is typically higher in other American cities.

Figure 2: NYC Annual Greenhouse Gas Emissions by Sector - 2005 to 2021

While real estate developers can and often do build green, energy-efficient buildings, new construction will not be enough to reach the city’s decarbonization goals. Ninety percent of existing buildings today are expected to still exist in 2050.⁶ Significant carbon reductions will require retrofits across NYC’s one million existing buildings. Given the complexity and magnitude of this decarbonization challenge, opportunities exist for each stakeholder in this ecosystem: real estate owners and developers, government, banks and mortgage lenders, insurance companies, service providers, and utilities.

### Landmark Climate Legislation in NYC and New York State

In 2019 New York City enacted the Climate Mobilization Act, which contained ambitious legislation designed to reduce the city’s building GHG emissions by 80% by 2050.⁷ Local Law 97 (LL97) requires NYC’s largest buildings to meet carbon emission limits (based on property type/use). The law places carbon caps on most buildings larger than 25,000 square feet. It covers about 27,000 properties that include approximately 50,000 buildings across NYC, contributing 50% of the GHG emissions from all buildings,⁸ and representing 60% of the total square footage in the city.⁹ The majority are residential multi-family buildings and account for 60 percent of the total square footage covered by LL97.¹⁰

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⁷ In addition to LL97, the Climate Mobilization Act includes LL97 and a number of other laws including: Local Law 92 & 94, requiring green roofs solar PV systems on certain new construction and renovation projects; Local Law 95, adjusting metrics used to letter grades assessing building energy performance; Local Law 96, allows for the creation of Property Assessed Clean Energy (PACE) Loans; Local Law 98, requiring the Department of Buildings to include wind energy in its renewable energy toolkit.
¹⁰ [https://www.urbangreencouncil.org/ll97-multifamily-pathways-to-2030/](https://www.urbangreencouncil.org/ll97-multifamily-pathways-to-2030/)
Starting in 2024, buildings that fail to comply (and do not have a compliance extension or alternative pathway of compliance) will face penalties of $268 for every metric ton of carbon dioxide equivalent (tCO2e) above the limit.

The LL97 mandates need to be read together with the requirements of the New York State Climate Leadership and Community Protection Act (CLCPA), which requires the decarbonization of the state's electricity grid by 2040. If the CLCPA meets its goals, a considerable reduction in building emissions required by LL97 may well be achieved. This will be more of a challenge for multi-family housing, where roughly 74% of the residential buildings subject to the LL97 emissions caps have onsite combustion of fossil fuels for heating and hot water, versus 42% of commercial buildings' emissions.\footnote{\url{https://www.urbangreencouncil.org/wp-content/uploads/2022/11/2019.06.18-Urban-Green-Retrofit-Market-Analysis.pdf}} Therefore, multi-family buildings are most in need of energy efficiency and carbon reduction investments.

Figure 4: NYC GHG Emissions in Buildings


Figure 5: Share of Square Footage whose 2018 GHG Emissions Exceeded LL97 caps after CLPA Grid Emission Reductions for 2024, 2030 and 2040 by segment

NYC Climate Laws Will Not Be Enough

Local Law 97 has been hailed as among the most ambitious building emissions laws in the world. Nonetheless, it may not go far or fast enough. The roughly 50,000 buildings covered under LL97 represent only 50% of NYC’s building emissions. Although fines begin to kick in for some buildings in 2024, the phase-in will take more than a decade before NYC will see substantial reductions in carbon emissions.\(^{12}\)

The law is also facing pushback from many in the real estate industry. New York’s commercial real estate market is currently facing an unprecedented set of challenges, particularly in the office building segment.\(^{13}\) Revenues, valuations and refinancing opportunities have all decreased significantly due to a combination of higher interest rates and the lingering effects of the COVID-19 pandemic. As businesses shifted to remote or hybrid work, office vacancy rates are projected to remain above 20%.\(^{14}\) It’s difficult for New York City to ignore these challenges when real estate taxes are the biggest contributor to its coffers, providing approximately 30% of the revenue for its budget.

\(^{12}\) “Only about 9% of square feet subject to emissions caps are expected to be over their emissions caps in 2024 if they maintain emissions at 2018 levels. The picture changes in 2030. At this point, about 49% of square feet will be over their caps if they maintain emissions at 2018 levels.” Carbon Trading for New York City’s Building Sector: Report of the Local Law 97 Carbon Trading Study Group to the New York City Mayor’s Office of Climate & Sustainability, June 2021 at 57.

\(^{13}\) For the first time since 2011, commercial real estate (CRE) prices in the US declined in the first quarter of 2023. This increases risk across the banking industry. Banks hold more than 60% of the $3.6 trillion worth of outstanding CRE loans. https://acrobat.adobe.com/link/review?url=urn%3Aaaid%3Ascds%3AUS%3Aae8ee1d9-0410-35aa-80ac-85a7ae30cac7. Office lease revenue has fallen by 19% since the start of COVID-19 pandemic. Research suggests that New York City’s office buildings may have plummeted in value by 40% to 45%. Work From Home and the Office Real Estate Apocalypse. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4124698

Given these structural and economic headwinds, it’s likely that penalties for failing to meet emission caps will be extended or reduced. Already on September 12, 2023, the NYC Department of Buildings (DOB) issued a new set of proposed rules on the implementation of LL97. The proposed rules provide a definition for the “good faith” standard that DOB will use to decide whether buildings that have not complied with the 2024 carbon emission limits are eligible for reduced penalties.  

### Measuring, Reporting, and Reducing Carbon Emissions

Carbon emissions fall into three categories - Scope 1, 2, and 3 with Scope 3 comprising more than Scope 1 and 2 combined.  

See Appendix B. According to the Carbon Disclosure Project (CDP), the nonprofit organization that runs an environmental disclosure system globally, Scope 3 emissions vary considerably by sector, but on average represent 75% of a company’s emissions. Scope 3 emissions are often associated with industries that are highly carbon-intensive, such as oil and gas extraction, coal-fired power generation or industrial agriculture, but they also include real estate. For financial institutions, Scope 3 emissions are estimated to be 99.8% of total emissions, as these include “financed emissions” – the total CO2 in their lending and investment portfolios.

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15 [https://www.nyc.gov/assets/buildings/local_laws/ll88_ll97_article.pdf](https://www.nyc.gov/assets/buildings/local_laws/ll88_ll97_article.pdf)
17 [CDP-technical-note-scope-3-relevance-by-sector.pdf](CDP-technical-note-scope-3-relevance-by-sector.pdf)
The Global Adoption of Scope 3 Reporting by Financial Institutions

Around the world, a growing number of companies and financial institutions are committing to disclose their Scope 3 emissions, while governmental regulatory bodies are creating legal mandates for transparency. Companies are increasingly reporting GHG emissions to the CDP. In 2023, of the 23,292 companies that disclosed environmental performance data to the CDP, 9,642 companies or 42% reported Scope 3 emissions. The number of companies disclosing Scope 3 emissions has grown exponentially from 1,599 and 2,567 in 2013 and 2020, representing increases of 503% and 276%, respectively.

18 At the request of the G20, the Financial Stability Board, an international body that monitors and makes recommendations about the global financial system, established the Task Force on Climate-related Financial Disclosures (TCFD) in 2015 to design a consistent framework of “disclosures that will help financial market participants understand their climate related risks.” The TCFD’s framework provides a uniform method to calculate GHG emissions and report Scope 3 disclosures across any company’s supply chain. Some of the biggest American financial institutions, including Bank of America, JP Morgan Chase, Citi, Wells Fargo, Morgan Stanley, and Goldman Sachs, have committed to net zero emissions by 2050. As part of that effort, they increasingly make investment decisions in consideration of the Scope 1, 2, and 3 disclosures of their potential investments. The four largest asset managers in the US – Blackrock, Vanguard, State Street, and Fidelity – have also made similar commitments. These asset managers all report their Scope 3 emissions in alignment with the TCFD framework. https://www.cdp.net/en/companies/companies-scores

19 Trends Show Companies Are Ready for Scope 3 Reporting with US Climate Disclosure Rule | World Resources Institute (wri.org)
Efforts are being made by the Partnership for Carbon Accounting Financials (PCAF) to provide financial institutions with transparent, consistent and harmonized guidelines for the accounting and reporting emissions. The PCAF Global Carbon Accounting and Reporting Standard for the Financial Industry (PCAF Global Standard) refines and extends the GHG Protocol’s accounting rules for Scope 3, category 15 (investments), with an aim to provide detailed guidance per asset class.\textsuperscript{20}

This movement to increased transparency is also apparent in the rapid growth of the UN-convened Net-Zero Banking Alliance (NZBA), whose member banks commit to achieving net-zero emissions in their loans and investments by 2050. In just two years, the Alliance has grown from 43 founding members to 136 banks in September 2023, and now represents 40% of global banking assets.\textsuperscript{21}


\textsuperscript{21} UN Net-Zero Alliance webpage. Membership requires that banks commit to transitioning the emissions from their lending and investment portfolios to align with a net-zero pathway. [Nine sectors, including real estate.] https://www.unepfi.org/wordpress/wp-content/uploads/2023/11/NZBA-Progress-Update-2023.pdf
State Scope 3 Disclosure Mandates

Two years ago the SEC proposed an ambitious climate risk disclosure rule that would require registrants to report their greenhouse gas emissions in the form of Scope 1, 2, and 3 disclosures. After receiving more than 240,000 comments, more than had ever been received in the SEC’s history, and facing threatened lawsuits, the SEC issued a final rule on March 6, 2024, and eliminated Scope 3 requirements. Nonetheless, emerging state regulatory requirements are mandating the disclosure of financed emissions.

California, which is the fifth largest economy in the world, just enacted and signed into law on October 7, 2023, the Climate Corporate Data Accountability Act. This is the most sweeping disclosure rule in the nation, and perhaps the world, requiring both public and private companies that do business in California with revenue of $1 billion or more to disclose Scope 1 and 2 emissions, starting in 2026. Mandatory Scope 3 emissions reporting would begin in 2027, with every company required to comply, regardless of whether or not it is headquartered in the state. Measurement and reporting will be required to be performed in accordance with the Greenhouse Gas Protocol standards. The law will also require companies to obtain third-party assurance for their emissions reporting. The new reporting rules will apply to most large US companies, as long as they operate in the California market. And disclosure will apply to the bank’s nationwide/worldwide portfolio, and is not limited to its California portfolio.

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22 Per the SEC, “a registrant would be required to disclose GHG emissions from upstream and downstream activities in its value chain (Scope 3), if material or if the registrant has set a GHG emissions target or goal that includes Scope 3 emissions.” [https://www.sec.gov/news/press-release/2022-46](https://www.sec.gov/news/press-release/2022-46)
26 The European Union recently adopted the first set of European Sustainability Reporting Standards (ESRS), that require ESG reporting for companies in the EU starting January 1, 2024. Many US companies will have to comply with the EU’s Corporate Sustainability Reporting Directive (CSRD), which includes mandatory reporting obligations for large companies doing business in Europe. While disclosure depends on “materiality,” the EU requirements are intended to be consistent with the new corporate reporting standards for sustainability and climate risk, or IFRS Standards, released by the International Sustainability Standards Board (“ISSB”) and used in 168 jurisdictions (but not the US). UK regulators are in the process of developing Sustainability Disclosure Requirements and investment labels (“SDR”), with a policy statement and final rules expected shortly.
Similar legislation has been introduced in the New York State Senate. The Climate Corporate Accountability Act, introduced in January 2023, would require US-based businesses with annual revenues greater than $1 billion, including revenues received by all the business entity’s subsidiaries that do business in this state, to report GHG emissions annually from their business, including direct emissions, electricity use, and indirect emissions from the supply chain and other sources.

While not specifically calling for measurement and reporting of Scope 3 disclosures, the New York State Department of Financial Services (NYSDFS) recently issued new guidance for banking and mortgage organizations to measure, monitor, and control climate related risks.

The revised guidance covers all New York State regulated institutions, most notably including mortgage bankers and mortgage servicers which have not historically been faced with the same scrutiny of climate related risk reporting as banks. The guidance defines climate-related financial risk as consisting of physical risks and transition risks, and provides that New York Institutions “should consider the effects of each of these types of risks on their operational resilience and their safety and soundness, as well as the particular consequences these risks may pose to their customers.”

Even as the SEC drops Scope 3 disclosure requirements, California has already set the stage and has created an example that could result in nationwide emissions disclosures, including many banks and mortgage lenders. And New York is not far behind.

27 https://legislation.nysenate.gov/pdf/bills/2023/S897A
Investors’ Net Zero Goals

Institutional investors are also demanding disclosure without an SEC rule. That’s because disclosures are increasingly important – and necessary -- in investment decision making. And more than 1,000 US companies already voluntarily disclose their Scope 3 emissions in response to investor demand.\(^{30}\)

For example, pension funds in New York have publicly committed to divesting from carbon intensive assets in the future and reallocating capital toward sustainable investments. Evaluation will be based on carbon disclosures. The NYC Comptroller’s Office ($242 billion in assets as of November 2023\(^{31}\)) has made clear, “We cannot manage what we don’t measure. We will set measurable goals and benchmarks across all investments and operations, including specific interim emissions reduction targets by asset class, and disclosure of Scopes 1, 2, and 3 emissions.”\(^{32}\)

The New York State Common Retirement Fund ($279 billion in assets and third largest pension fund in the US) is a strong example of how financial institutions will include greenhouse gas emissions in their investment decisions, stating: “failure of companies to appropriately manage and comprehensively report climate and other material ESG risk may lead the fund to withhold support from audit committee members, directors responsible for oversight, or the entire board.”\(^{33}\)

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33 Responsible Investor 2022.
One objection to scope 3 carbon disclosures is that scope 3 represents indirect emissions and data is unavailable. For banks and mortgage lenders, however, the carbon emissions from their mortgage portfolios can be easily calculated where buildings are required to report on performance standards and provide benchmarking. While NYC has been a leader, more than 53 cities, counties, and states require energy benchmarking (an ongoing review of a building or organization’s energy consumption and performance) for public, commercial, and/or multifamily buildings (see Figure 7 and 8 below). Each jurisdiction has unique legislation that stipulates exactly what must be reported, but benchmarking creates the baseline against which carbon reduction goals can be measured. Most importantly, benchmarking allows mortgage lenders to see quickly the level of carbon emissions in their mortgage portfolios and move to finance decarbonization of those mortgages.


Performance standards also set the stage for legislative carbon reduction requirements. Other cities are following New York’s example with laws that include decarbonization as a requirement in permitting new developments and mandate substantial retrofitting to meet ambitious carbon targets in the near future. Several cities go beyond benchmarking requirements and now or will soon impose carbon penalties for new or existing buildings that do not meet their GHG emission reduction goals. These include New York (Local Law 97), San Francisco (CALGreen), and Boston (Building Emissions Reduction and Disclosure Ordinance). New York City’s law is more comprehensive in that it includes penalties for all existing and new buildings over 25,000 square feet, whereas other cities have limitations such as the number of floors in the building or only applying such laws to new builds.
Another Driver: EPA Designation of Carbon as a Pollutant

When Congress passed the Inflation Reduction Act in August 2022, it amended the Federal Clean Air Act to include carbon dioxide and other greenhouse gases as air pollutants, which the EPA has both the authority and responsibility to regulate.\(^\text{34}\) The importance of this move has not yet been fully absorbed and analyzed by the real estate industry. It will likely require that building owners in the future include carbon in property benchmarking reports and Integrated Physical Needs Assessments (IPNA), which provide a holistic assessment of a property’s physical conditions, or equivalent property assessment tools such as the Phase One Environmental Assessment. And it will likely mean property owners will need to remediate carbon, just as they have managed asbestos and radon in the past, or face litigation.

The Critical Role of Mortgage Lenders

While LL97 focuses on building owners and their compliance with the emission caps, mortgage lenders can and should be a critical driver in the push for a net-zero New York.

They can help create a clear value proposition for building decarbonization, align existing lending products, catalyze new lending products, provide technical assistance to their borrowers, and much more.

Savvy mortgage lenders recognize that decarbonization offers a wealth of opportunities to enhance their business, while positioning themselves to operate under new disclosure requirements that are headed their way. European banks are several steps ahead in this regard, as examples later in this paper illustrate.

Lenders should carefully consider the growing evidence that suggests green buildings (and their owners) represent a lower-risk investment. For one, energy efficient properties tend to command higher valuations – known as “green value.” A study by the Lawrence Berkeley National Laboratory looked at residential properties and found that a one point increase in Home Energy Score resulted in a 0.5% increase in market value.\(^{35}\) Secondly, green buildings cost less to run, as energy efficient design features and technologies, such as insulation, efficient lighting, smart HVAC systems, and renewable energy sources, help reduce energy consumption and utility bills. With lower expenses, the “green” borrower has more cash flow to repay the loan, thereby reducing what banks call the “probability of default.”\(^{36}\) Finally, green buildings are more resilient to any “brown discount” (an increased depreciation rate of energy inefficient buildings).\(^{37}\) These trends are expected to increase over time. The balance of this paper surveys new regulatory requirements and investor demands for carbon disclosure, as guidance for the task of measuring and managing the carbon emissions within lending portfolios. The paper also outlines how lenders can capitalize on the numerous existing green financing products and opportunities for innovative instruments in the green finance market that can be offered to property owners to fund decarbonization.

See Appendix A for details on the financial advantages of energy efficient portfolios.


\(^{36}\) Id.

\(^{37}\) LaSalle Investment Management published a meta analyses of 41 studies conducted over the last 10-15 years looking at the hard evidence of the “value of green” in September, 2023, and found rent premiums of 5-15%, increased asset value of 5-25%, as well as higher occupancy and lower costs of financing. [https://commercialobserver.com/2021/11/sustainability-is-key-feature-as-tenants-look-to-owners-for-greener-buildings/](https://commercialobserver.com/2021/11/sustainability-is-key-feature-as-tenants-look-to-owners-for-greener-buildings/)
Global Examples for Mortgage Bankers Action

Mortgage bankers can tap their expertise and innovate to respond to increasing carbon disclosure requirements, as well as to help their NYC clients comply with LL97.

The largest commercial real estate mortgage lenders in New York City are mostly banks – JP Morgan Chase, Bank of America, Wells Fargo, Santander, Goldman Sachs – to name a few, but firms like CBRE, Walker & Dunlop, and MetLife also lend in NYC and across the US.

Europe provides some intriguing models for banks in terms of emissions reporting and decarbonization strategies for their real estate portfolios. Disclosure of GHG emissions is providing lenders with the information and opportunity to make greener and, in the long-run, less risky investment decisions.

Deutsche Bank Taking the Lead

In March 2023, Deutsche Bank (DB) became the first bank in the EU to disclose its financed emissions in its residential real estate loan portfolio and propose a plan to decarbonize. These disclosures followed similar ones in its corporate loan book in 2022. The bank has now published financed emissions data for approximately 60% of its total loan book.

A founding member of the Net Zero Banking Alliance in 2021 and committed to Science Based Target (SBTi), Deutsche Bank has proposed a comprehensive package of financial assistance, offering consulting and innovative financing products. With a mortgage lending portfolio of more than 1.5 million properties, DB has expanded its loan offerings to include green mortgages (i.e mortgages with more favorable terms or increased loan amounts for energy efficient properties or enhancements) and financing for remodeling, enabling DB to capitalize on an estimated €600 billion demand for energy modernization. In addition to providing financing solutions, DB is creating a consulting practice to assist their customers with their energy retrofits.

Although focused on its residential mortgage portfolio, DB provides a model for the US mortgage lending industry. While DB is taking the lead in disclosure, there are plentiful examples of green mortgages throughout the UK and Europe.

The UK - Where Green Mortgages Are Mainstream

Data from the Green Finance Institute in the UK shows that the green mortgage industry in the UK is gaining momentum. Today, it is estimated that green mortgages in the UK represent 15% of the total market. There are 37 major mortgage lenders offering 60 green mortgage products, each with its own set of criteria. Over half of these mortgages can be used for energy efficient retrofits.

41 Id.
42 https://www.greenfinanceinstitute.co.uk/wp-content/uploads/2021/05/GREEN-FINANCE-GREEN-MORTGAGES.pdf
44 https://www.greenfinanceinstitute.co.uk/programmes/ceeb/green-mortgages
As an incentive to either buy a green building or to renovate an existing one to make it greener, the lenders offer a lower interest rate, give cash back, or increase loan amounts. These loans come in a variety of different forms and provide an affordable way to pay for upgrades that may be costly up front, but save money over the long run.

Figure 9: UK Mortgage Lenders and Green Mortgage Offerings

<table>
<thead>
<tr>
<th>Mortgage Lender</th>
<th>For improved energy efficiency of renewed/retrofitted property</th>
<th>Low-interest rate mortgage for new and/or existing customers</th>
<th>Additional borrowing for new and/or existing customers</th>
<th>Cashback/Refund for new and/or existing customers</th>
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<td>Grand Total</td>
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Source: NYU Center for Sustainable Business, using data from the Green Finance Institute

The UK began providing green mortgage products 17 years ago, when the Ecology Building Society offered discounted mortgage rates in 2006 to homeowners building, converting or retrofitting sustainable homes. With the financial crisis, interest in the space stalled for a decade.
Then, in 2018, Barclays became the first major lender to offer a green mortgage product. It launched the Green Home Mortgage, which provided discounted rates on mortgages to buyers of new homes that had an Energy Performance Certificate (EPC) rating of A or B.

In the UK, banks such as Barclays and NatWest, fund domestic residential mortgages by issuing green bonds. In November 2017, Barclays issued the inaugural green bond by a UK bank to finance or refinance UK residential mortgages in the top 15% of the lowest carbon intensive buildings.
This first bond issuance was for €500m; it was followed by a second bond in 2020 for £400m ($518m). In November 2021, NatWest Group issued its first similar bond for £600m. In addition, these banks also assist real estate firms, such as Landsec, with the issuance of their own green bonds.

### The EU - Growing Residential and Commercial Green Mortgages

Elsewhere in Europe, green mortgage products are available both for single-family homes and multi-family, commercial properties. In February 2021, the EU launched the Energy Efficient Mortgages Initiative (EEMI) to stimulate the mortgage industry to fund more green buildings and renovation, and create a standard reporting template for the sector. It was established to help achieve the goals set out under the COP 21 Paris Agreement, as well as provide financial stability by reducing the credit risk for banks and financial institutions and improve the energy performance of Europe's building stock. While residential green mortgages abound, particularly in Scandinavian countries, below are some green commercial mortgage models.

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49 **Netherlands:** The Dutch announced the formation of the Energy Efficient Mortgages NL Hub (EEM NL Hub) in November 2021. The group is led by stakeholders in the Dutch residential housing and mortgage market. So far, Intertrust Group is the only corporate service provider to join the full member list. The purpose of the hub is to act as the local knowledge center for Dutch energy-efficient mortgages, translating Europe-wide regulation such as the EU Taxonomy for the Dutch market. **Norway:** The DNB (Norway’s largest financial services group) offers green mortgages. They give extra favorable terms, help and advice through the process and possibly flexibility on repayment or an interest-only period. On their webpage, they have an example: Nominal floating interest rate from 5.04 %, annual percentage rate of charge (APRC) from 5.23 %. Annuity loan with monthly payment NOK 11,803. The total amount payable would be NOK 3,544,090 made up of the loan amount plus interest of NOK 1,544,090. Nordic Energy Efficient Mortgage Hub (for Denmark, Norway and Sweden). The NEEM project works along this value chain with several pilot banks and focuses on residential real estate limited to single-family privately owned homes. **Sweden:** The Skandinaviska Enskilda Banken AB (SEB) launched green mortgages in 2018.
Commercial Mortgages

A number of banks in the EU have started offering energy efficient mortgages for commercial real estate. Specifically, banks give preferential treatment and interest rates to commercial properties that can demonstrate certain benchmarks of energy efficiency. These efforts not only reduce carbon emissions, but also help banks reach ESG performance metrics, typically set internally by firms themselves. However, most of the energy efficient mortgages still finance residential properties even when a bank offers such financing terms for both commercial and residential properties.

Germany. Berlin Hyp AG represents one of the few banks where commercial mortgages and commercial energy efficient mortgages far exceed their residential counterparts. Berlin Hyp AG has issued €9,106,000 in energy efficient mortgages, which represent 28% of their total portfolio.\(^5\) 37% of mortgages issued for commercial properties are energy efficient, representing Germany’s aggressive approach to decarbonizing the built environment through commercial real estate. By contrast, only 8% of mortgages issued for residential properties by Berlin Hyp AG are considered EEMs.\(^6\)

Spain. Caja Rural de Navarra (CRN) is a bank that provides financial services in the regions of Navarre, Basque Country and La Rioja in northern Spain. The bank has a “credit co-operative” legal structure in which borrowers are shareholders of the bank, allowing them to make decisions to determine the strategy of the bank. To this end, CRN donates 10% of its annual profits to its Social Welfare Fund to develop social and environmental initiatives in the community that it serves.\(^7\)

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50 [https://www.energy-efficient-mortgage-label.org/issuer/31-berlin-hyp-ag](https://www.energy-efficient-mortgage-label.org/issuer/31-berlin-hyp-ag)
51 [https://www.energy-efficient-mortgage-label.org/product/38/graph/197/share-eem](https://www.energy-efficient-mortgage-label.org/product/38/graph/197/share-eem)
The bank issues green mortgages (“Hipotecas verdes CRN”) to both commercial and residential properties and has financed 531 commercial energy efficient mortgages, representing 8% of its total commercial mortgage portfolio. In line with energy efficient mortgages being far less common in commercial properties, residential energy efficient mortgages account for over 95% of energy efficient mortgages that CRN has issued.

Hungary. MBH Mortgage Bank Co. Plc is a business group that provides mortgage banking services. MBH Mortgage Bank has a particularly strong focus on sustainability and has issued 7,702 loans total, with 23% of loans being Energy Efficient Mortgages. While energy efficient mortgages are available for commercial properties, the bank has yet to issue a single energy efficient mortgage for a commercial property.

Additional European commercial energy efficient mortgage lenders recognized by the EEMI include Sweedbank AP in Sweden, Jyske Realkredit in Denmark, and Volksbank in Italy.
Green Financing Options in the U.S.

Decarbonizing the built environment is going to require significant financial resources and innovation. Given the complexity of the real estate industry, there is no “one size fits all” solution. Already, there are some green lenders with a range of offerings, but their reach is limited. Banks and mortgage lenders have an opportunity to become leaders and innovators. European models and modest US programs (largely residential), can serve as the foundation on which to build a more robust green mortgage industry.

Commercial Property Assessed Clean Energy (C-PACE) Loans

C-PACE is a type of green loan that is repaid through a special assessment on the owner’s property tax bill, typically over a period of 10-20 years. While C-PACE programs are not publicly funded, the loan program is closely regulated and available only in states and municipalities that have passed legislation authorizing the program. As a public/private partnership, the program is administered publicly and the lenders are private specialty finance companies and banks. The types of projects that are eligible depends on the terms of the enabling legislation. In most places the loans can be used for energy efficiency, water conservation, and renewable energy projects. Others include earthquake protection, wind resistance, flood control, and stormwater protection. Some programs also require projects to show a specified level of energy savings to be eligible.

PACE financing can benefit all parties. The loans help borrowers make sustainable upgrades that reduce their carbon emissions. For the lenders, they
provide opportunities to diversify bank product suites and build a robust green financing platform, offering several cross-sell opportunities. It is an opportunity for lenders to both make money and to reduce financed emissions. Also, becoming a PACE loan originator may improve clients’ ability to repay existing loans and increase the value of the loan collateral, reducing the overall risk to the lender.

New York City joined what is now thirty-eight states, plus the District of Columbia with laws enabling the C-PACE lending program. Since 2009, C-PACE loans have provided $5.2 billion and funded over 3,100 commercial projects in the US. Retrofits and new construction account for 86% and 14% of these projects, respectively.57

The New York City C-PACE Program

New York City's C-PACE program was initially viewed as the critical finance companion to support compliance with the mandates and penalties of LL97. The low cost, long-term loan program for commercial properties was enabled by legislation (LL96) and launched in June 2021, as a key instrument to help property owners finance energy efficiency and renewable energy projects, as well as deferred maintenance upgrades in existing buildings and avoid fines for exceeding emission caps.

According to NYSERDA, the cost of decarbonizing the 27,000 properties covered by LL97 in New York City is estimated at $24 billion58 – making New York City potentially the largest C-PACE market in the country. New York’s C-PACE program is administered by the New York City Energy Efficiency Corporation (NYCEEC), a public benefit corporation. To date, 14 private originators have been approved by NYCEEC to provide financing, with minimum loans ranging from $500,000 to $5 million. JP Morgan Chase and Nuveen are among these originators.

Since the C-PACE launch in June 2021, the program has been slow to gain traction. Only 111 Wall St (see sidebar) and one other C-PACE-financed deal have closed (730 3rd Ave, by Greenworks Lending, now Nuveen Capital) and only a handful more are in the pipeline. New York City’s green financing initiative has been plagued by regulatory delays. Because C-PACE is a property tax assessment rather than a loan, the program requires legislation by both New York state and NYC governments.

**New York’s First C-PACE Loan: 111 Wall Street**

The first C-PACE deal in New York closed in June 2021. As part of a $500 million financing package to modernize 111 Wall Street, $89 million in C-PACE financing was provided to fund energy efficient retrofits required to bring the building into compliance with LL97. The project saved an estimated $2.5 million in annual energy costs and $750,000 in annual LL97 fines through 2030.

The biggest challenge in closing the deal was getting consent to the C-PACE loan from the senior lender. The parties in the deal overcame the senior lenders’ initial reluctance by persuading them of the financial strength that would result from PACE lending. The lenders in the deal believed it set the stage for more PACE loans and would attract interest in PACE from the boroughs, outside Manhattan. They were also optimistic that banks would become more welcoming to PACE loans in their portfolios, which would also add momentum to banks originating PACE loans themselves.

Unfortunately, 111 Wall Street is now in default due to the office vacancy market, not because of its PACE financing. Nonetheless, how that building manages its C-PACE obligation may impact New York City’s C-PACE market.

Other factors have also tempered the demand for C-PACE loans in NYC. Initially, the program had a narrow scope and was only made available to existing buildings. Then, in March 2022, the New York City Mayor’s Office of Climate & Environmental Justice and NYCEEC issued revised guidelines that included financing for new construction and confirmed that buildings subject to ground leases are also eligible to apply for PACE loans.

In addition, for projects to quality, they have to be in compliance with NYSERDA’s cost-effectiveness criteria for energy efficiency improvements, which can often be narrowly defined.

While many have expected NYC to become one of the top C-PACE markets because of its vast, aging building stock, real estate owners and lenders need to get more comfortable with the program. Given the current interest rate environment, some underlying mortgage holders are refusing to consent to C-PACE or even consent to subordinate loans.

Despite the bumps in the program and in the market, C-PACE loans should be an important mid-cycle opportunity for lenders. Banks and mortgage lenders can originate C-PACE loans themselves, rather than waiting for a building owner to seek their consent. As banks consider originating C-PACE loans, providing capital for the loans can be paired with robust lending standards and ongoing collaboration with municipalities. JP Morgan Chase, for example, has announced that it plans to finance and facilitate more than $2.5 trillion through the end of 2030 to advance long-term solutions that address climate change and contribute to sustainable development.60

**Deploy and Innovate Green Financing Alternatives to C-PACE**

Just as LL97 is not going to be fully effective in driving building decarbonization at the speed that we need, neither is PACE the sole solution to financing decarbonization. Many types of financing can be used to help reduce real estate’s carbon footprint. Banks, mortgage lenders, finance companies, CDFIs, energy services companies, and other organizations that provide capital can offer loans (mortgages and green mortgages), equipment loans and leases, energy services agreements, power purchase agreements or other forms of financing to fund energy efficiency, decarbonization, resiliency, as well as clean energy projects and technologies.

For these lenders, green financing products provide opportunities to cross-sell and diversify their suite of products. It is also a way for lenders to deliver on their net zero pledges and meet their carbonization targets. Green financing is an opportunity to tap into a growing market, make money, and to reduce financed emissions.

Close to NYC, Inclusive Prosperity Capital (IPC), a nonprofit investment fund, provides clean energy financing solutions and aligns investment capital with organizations and projects in traditionally underserved communities. IPC spun out of the Connecticut Green Bank in 2018 and works in partnership with the State of Connecticut’s Department of Energy and Environmental Protection and philanthropic funders including The Kresge Foundation and Hewlett Foundation. It provides debt financing and long-term ownership to community solar projects. IPC is about to enter into a partnership with NYCEEC.

From the perspective of the building owner, financing the cost of energy efficiency projects helps maintain building reserves for other needed capital replacements, preserve lines of credit for other uses and avoid resident assessments for co-ops and condos. In addition, financing helps fund large projects, stalled projects or properties with many projects, as well as cover project costs with minimal or no upfront fees.

**Mortgages and Green Mortgages**

At the point of refinancing or loan origination, mortgage lenders can facilitate retrofits by including funds to cover energy improvements as part of the mortgages they offer to their clients. Mortgages that are designed to target and incentivize energy improvements and upgrades are called green mortgages. In general, long-term, low-interest rate mortgage loans are cost-effective financing vehicles that can help property owners and buyers upgrade energy features and reduce operating costs through energy efficiencies.
Green mortgages or energy efficient mortgages (EEMs) are a better alternative for financing energy improvements than traditional home improvement loans. The latter are unsecured loans (higher interest rates and shorter returns) that may not be suitable for comprehensive projects that deliver deep energy savings and may include weatherization, HVAC upgrades and solar PV installations.

**Build a Green Mortgage Industry in NYC and the US**

Unfortunately, there are not widely available, workable and successful financing products that make it easy to roll the cost of energy improvements into mortgages in NYC or the US. While it is true that Fannie Mae and Freddie Mac offer energy-efficient mortgage products through their lender partners, such as JPMorgan Chase or Wells Fargo, these only apply to single-family homes and multi-family rentals. EEMs are usually more flexible in areas such as loan-to-value and debt-to-income ratios. A barrier to EEMs, however, is that buyers will need technical assistance (e.g., an energy audit) to understand their current energy usage, available options, cost estimates, and anticipated payback timeframes. Uptake of EEMs has been modest due to limited lender guidance, benefits to lenders, and consumer information.

Nonetheless, some lenders are providing mortgages that incorporate significant capital improvements for energy retrofits into the mortgage loan. The Community Preservation Corporation (CPC), a CDFI and nonprofit multifamily finance company that provides resources to underserved communities, is a leader in pushing the lending market to underwrite energy savings. In August 2022, the CPC announced a partnership with Valley National Bank to support commercial real estate financing for new construction in affordable housing. The partnership will fund up to $100 million in loans tied to ESG principles that meet certain green building standards and reduced emissions. Below is an example of a more structured green mortgage program for the residential market in Vermont.

Vermont’s Clean Energy Mortgage

In Vermont, the Vermont State Employees Credit Union (VSECU), a nonprofit credit union, piloted a green mortgage called the “Clean Energy Mortgage” (CEM), with the support of a grant from the Department of Energy, Energy Futures Group (EFG), ClearlyEnergy and the Northeast Energy Efficiency Partnerships.

The mortgage, which incorporated home energy improvements into the mortgage process, proved to be a win-win for lenders and borrowers. With the support of an energy coach and by offering a discounted interest rate of 0.50% in exchange for adding energy improvements, customers were willing to borrow significantly more, resulting in substantially larger energy projects and energy savings. Energy projects grew 87% larger than originally requested by the customer. In addition, the energy projects ended up at 25% of the total refinance loan amount and were three times larger and more comprehensive than the typical Vermont energy projects. The average Home Energy Score (HEScore) increased by 3.0 points, saving more than $1,000 in annual energy costs.63

The CEM pilot program in Vermont demonstrated that the tradeoff between lower interest rate and larger mortgage size is a win-win for lenders and borrowers. VSECU, the lender, was willing to offer a lower interest rate in exchange for the chance to increase the mortgage size to incorporate energy improvement measures. Borrowers were willing to increase the size of their mortgage in exchange for a lower interest rate, energy savings and increased comfort. Because of the lower energy costs, neither party is taking on substantially more costs or risks in the transaction.

63 Financing Energy Improvements in the Mortgage; https://aceee2022.conferencespot.org/event-data/pdf/catalyst_activity_32460/catalyst_activity_paper_20220810190531394_84f20784_1b92_4c3d_91e7_81470f14fb91
Implement New Mortgage Underwriting and Other Practices

In 2022, the Federal Reserve Bank of New York convened housing, mortgage banking, and finance experts over nine sessions to consider the challenges of financing decarbonization in affordable housing in New York State. Its October 2022 report, "Sustainable Affordable Housing: Strategies for Financing an Inclusive Energy Transition," concluded “[f]or market-rate properties, financing the necessary upgrades is feasible, either through operating income or additional debt.”64 The report went on to make a wide range of recommendations for affordable housing, most of which are equally applicable to market-rate buildings. The report makes clear that “[f]inancial institutions can play a role by devising new financial products to fund the transition and by helping to align incentives among stakeholders.”65 In addition, there is an untapped opportunity for the Community Reinvestment Act to drive banking support for affordable housing by incentivizing banks, financially or otherwise, to invest in securities tied to environmentally friendly projects for affordable housing.

The following are among the applicable recommendations that were proposed:

- Use “sustainability-linked pricing" or pricing for risk reduction of loans to decarbonized buildings and projects meeting minimum energy performance standards or achieving energy efficiency certifications.
- Provide financial “rewards” to owners for reducing lenders’ climate-related financial risks.
- Build in longer amortization for loans used in decarbonization. This would lower the debt service and improve the coverage ratio.
- Create transparency about the costs of noncompliance in underwriting. Demonstrate the cost to the building owner of not undertaking measures to decarbonize and upgrade energy efficiency – e.g. non-compliance penalties under New York City’s Local Law 97.

65 Id. at 6.
• Bring forward increased future value of carbon neutral buildings with appraiser recognition and present documentable evidence of improved cash flow from these investments (e.g., lower insurance premiums).
• Simplify the process of obtaining mortgage holder consent. Have first mortgage lenders become PACE lenders, or create supplemental products that specifically address decarbonization and which are fully subordinate to the first mortgage.

The report also included recommendations for legislative, regulatory, and policy-changes that would encourage building decarbonization. While the report is focused on affordable housing, which has an alternative and varied pathway to LL97 compliance, its recommendations are particularly relevant to this discussion since LL97’s biggest impact will be on residential multi-family properties.

Green Mortgage Bonds as an Engine

Fannie Mae and Freddie Mac support the real estate market in the US primarily by purchasing mortgage loans from lenders and securitizing them into mortgage-backed securities (MBS), which they then guarantee and sell to institutional investors. In terms of green financial instruments, Fannie Mae has been issuing green bonds since 2012, and, according to Environmental Finance Data, it was the number one issuer of green bonds in the US and globally in 2022 with $10.5 billion of green bonds. (see Appendix C for more information)

While Fannie’s and Freddie’s green bonds offer liquidity to lenders, their products  

66 These include: Providing Tax Incentives and Regulatory Relief, Particularly to Early Adopters; Leveraging Policy and Mission-Motivated Investments to Increase Supply of Capital; Standardizing Utility Pricing and Leverage Utility Lending Models; Leveraging Government Policy and Regulation; Aggregating Evidence of Improved Cash Flow; Developing and Scaling Direct-to-Consumer Models; Advancing Measurement and Standards and Develop (or evolve existing) Certification Standards, Including a Common Set of Metrics, To Cover Decarbonized Buildings: Treating Carbon Emissions Like a Pollutant; and Promoting Awareness and Education.
67 Fannie Mae tends to buy loans from larger commercial banks and lenders. Freddie Mac usually buys loans from smaller banks or credit unions.
are limited to new single-family properties or multi-family rentals. There is still a need for a mechanism to provide liquidity to lenders who finance energy-efficient upgrades in condominium, co-ops, mixed-use and office buildings. The scale and diversity of NYC’s real estate market make it an ideal candidate for innovation in the MBS market. Similar to Barclays and NatWest in the UK, US banks could also issue their own green bonds as a way to finance their mortgage operations.

**Focus on Multi-Family as the Biggest Decarbonization Target**

Lenders looking for decarbonization opportunities should prioritize green financing for multi-family residential real estate. Such properties are unaffected by the economic problems afflicting commercial real estate, and represent the sector that will be most affected by LL97, with multi-family housing comprising about two-thirds of LL97 covered buildings. And with their gas furnaces and hot-water heaters, residential units can’t depend on a decarbonized electrical grid to meet their emission caps.

*Figure 11: Change in Residential Buildings Energy Use*

Source: NYC Greenhouse Gas Inventories
A Call to Action

The mortgage banking industry can play a crucial role in tackling climate change by helping to decarbonize buildings, while mitigating their risks and creating new product offerings.

As we’ve outlined in this white paper, through the use of green financing banks can collaborate with their borrowers to provide strategic financing for energy efficiency retrofits, making buildings in New York City greener as well as more profitable in the long term.

C-PACE is one tool. But it’s time to build a robust green mortgage sector in the banking industry. As mortgages reach maturation in a portfolio, mortgage bankers can draw on models from a range of diverse green mortgage products offered in Europe and Vermont. Mortgage bankers can also look to the recommendations from the New York Federal Reserve Bank and implement changes to their overall underwriting practices, with a clear eye to the need for accessible capital for building decarbonization.

Next Steps: Collaborating for Solutions

NYU Stern CSB and the Chen Institute at NYU Stern, in partnership with NYCEDC, want to build a network of industry leaders, forward thinkers, and innovative talent. That’s why together we are launching a solution-focused advisory task force. With this tactical and practical initiative, we aim to spur banks, mortgage lenders, and other finance actors to engage actively with this problem and assume a leading role in the decarbonization of NYC’s built environment.
With greater awareness of the carbon emissions within their own mortgage portfolio, we hope to unlock the building decarbonization potential of banks and mortgage lenders and build more streamlined lending pathways for retrofit projects.

The initiative will consist of an initial forum to convene public and private building decarbonization finance leaders, an ongoing taskforce to develop solutions to market and regulatory hurdles to capital deployment, and regular convenings with policymakers and other LL97 advisory groups. Together, we can answer key questions and stimulate innovation in building decarbonization within mortgage banking and the broader climate finance industries.

Tools and Resources to Support Collaboration and Action

As the mortgage banking industry steps up to the decarbonization finance challenge, it can tap data resources and finance roadmaps to guide and prioritize action.

The Decarbonization Compass: A Guide for Green Lenders

To assist property owners, mortgage lenders and other stakeholders, the NYU Stern Center for Sustainable Business (NYU Stern CSB) has developed the Decarbonization Compass, a data tool that maps and aggregates information on the approximately 27,000 properties that fall under the LL97 mandates. The tool allows users to see the carbon emissions and potential fines applicable to buildings. The data can be filtered by owner, mortgage lender, carbon emissions,
potential LL97 fines, energy scores, and more. Uniquely, the tool identifies the existing mortgage holder of buildings covered by LL97, allowing a user to see the top carbon emitting buildings and aggregate carbon emissions in a lender's portfolio.69

NYU Stern CSB initially created this finance map to support NYC’s Commercial Property Assessed Clean Energy (C-PACE) lending program. Because lender consent can be a significant barrier to C-PACE, the initial plan was to use the data tool to prioritize outreach to those lenders with the highest carbon emissions in their mortgage portfolios. Over the last few years, however, the practical limits of LL97 grew clearer – the law’s constraints, its implementation timeline, the current high interest rate environment, and the probability that the threat of fines alone won’t drive building owners to decarbonize as quickly as needed to achieve the City’s net zero carbon goals. With this came the realization that the stakes are too high to focus exclusively on property owners, with the hope they will pursue a C-PACE loan and seek consent from their mortgage lender. Instead, NYU Stern CSB saw the strong interests of those mortgage lenders and the critical role that financial institutions can play in tackling decarbonization challenges with a market-driven approach. And the enormous need to educate both real estate owners and mortgage lenders about the LL97 mandate and its opportunities became apparent.

69 The mortgage lenders that hold the largest number of LL97-covered properties in their portfolios include: New York Community Bank, JP Morgan Chase, Signature Bank, Fannie Mae, and Apple Bank.
NYC Accelerator’s Financing Roadmap For Property Owners

The NYC Accelerator, a program launched by the Mayor’s Office of Sustainability and Environmental Justice, provides a resource for property owners looking to decarbonize and seeking any needed financing. While the Accelerator’s Energy Efficiency Financing Roadmap identifies key funding mechanisms for property owners, mortgage and other lenders can use it and the Accelerator as a resource to market their own loan offerings. The Accelerator outlines the financing options and 13 approved green finance lenders that offer products other than C-PACE and are available in NYC based on a building’s life cycle:
Continuing Collaboration

This work is a “working white paper” to encourage advice and feedback in what will inevitably be a long process in mobilizing finance for building decarbonization in NYC and throughout the US. We hope to build the learnings as we move forward with the continued focus in NYC.
Environmentally sustainable practices in the real estate industry look to produce greater economic viability and positive financial outcomes. In a comprehensive study examining the relationship between environmental performance and financial indicators in the real estate sector, it was observed that Real Estate Investment Trusts (REITs, companies that own and typically operate income-producing real estate) with a higher proportion of environmentally certified buildings demonstrate lower bond spreads in the secondary market. Simply put, environmentally-conscious REITs produce returns with lower variance than generic REITs. These findings, consistent across various estimation strategies, suggest that the market efficiently incorporates environmental risk into the pricing of real estate debt. Notably, this correlation between environmentally certified buildings and reduced bond spreads was established through the use of widely accepted measures such as LEED and Energy Star certifications, which served as proxies for the energy and environmental efficiency of buildings and portfolios. The positive correlation between environmental certification and financial performance is further supported by empirical evidence indicating that certified buildings tend to exhibit higher and more stable occupancy rates, along with increased marginal rents and transaction prices. REITs with a higher concentration of environmentally certified buildings are associated with improved operational performance and reduced systematic risk, additional factors that yield lower bond spreads.

Investment into energy efficient infrastructure for buildings not only increases property values but reduces building operating costs further down the line, leading to lower default rates for efficient properties. In a study conducted by researchers at Berkeley Haas, the team merged large mortgage performance datasets for commercial office and multifamily properties from TREPP with energy consumption data obtained through cities' energy consumption disclosure laws.

70 https://www.sciencedirect.com/science/article/pii/S0378426619300470
The results suggested a notable correlation between higher energy usage and an increase in mortgage default rates. Similarly, correlations were identified with electricity prices, indicating that higher prices were associated with higher default rates. The Berkeley Lab has conducted several additional studies that underscore the impact of tenants and mortgage holders paying more for energy and how this impacts the long-term outcome of the building.

Financing or owning energy efficient properties provide major financial benefits. One study showed that mortgages on LEED-certified commercial buildings translated into a reduction of $147,000 to $206,000 in the annual interest payment of an average commercial mortgage in the sample. In addition, the average value of environmentally certified buildings is almost four times as high as the value of non-certified buildings: $167 million and $38 million, respectively.73 The same research also showed that for REITs, doubling “environmental certification” share, that is, increasing the allocation to environmentally certified buildings for an average REIT from 3 to 6 percent corresponds to a decline in annual interest expense of $687,000 per bond.74

74 Id.
Appendix B

Carbon emissions are grouped into three different categories associated with a company or organization's activities.

Scope 1 emissions are greenhouse gas emissions that come directly from sources that are owned or controlled by the company, and include emissions generated from company-owned on-site boilers and furnaces or vehicles.

Scope 2 emissions are indirect greenhouse gas emissions that result from purchased electricity, steam, heat, or cooling consumed by the company. These emissions are produced by the third-party utility companies that generate the energy.

Scope 3 emissions include all other indirect emissions. They are typically generated from the upstream and downstream activities of the company, such as emissions from the production of raw materials, transportation of goods and services, and use and disposal of the products sold by the company. Scope 3 emissions often represent the majority of a company's total carbon footprint.
Figure 14: Scope 1, 2 and 3

Appendix C

Since inception, Fannie Mae has infused over $115 billion into the global green bonds market through over 4,800 individual bonds (through September 30, 2023). In addition, Fannie Mae launched a green MBS for single-family residential homes in 2020 and issued over $3.3bn of single-family backed MBS to date.

Figure 15: Fannie Mae Historical Green Bond Issuance - Multifamily

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75 https://capitalmarkets.fanniemae.com/sustainable-bonds/green-bonds
76 As of September 30, 2023.
Appendix D

Mortgage Loans (or line of credit): These loans offer attractive, low rates and long-term options and can include funds to cover energy improvements. Mortgage loans are most beneficial for building owners who are already planning to refinance.

Green Mortgages: These are a type of mortgage loan designed to target and incentivize energy improvements and upgrades. Green mortgages provide increased loan amounts based on projections of energy savings that result from the upgrades. As an incentive to either buy a green building or to renovate an existing one to make it greener, the bank would offer a lower interest rate, give cash backs or increase the loan amount.

Mid-Cycle Financing Products

Buildings that are in the middle of their mortgage are called “mid-cycle.” Conventional loans tend to have a term length of seven to ten years. This group would include buildings that are one to three years away from being able to refinance. Below are financing product recommendations for mid-cycle financing products:

PACE loans: For projects exceeding $500,000, NYC Accelerator Property Assessed Clean Energy (PACE) Financing can be an option for multi-family buildings. It offers long-term, fixed-rate financing, covering up to 100% of project costs with no cash up-front from the owner. PACE Financing is unique in that it provides long-term financing and is repaid on the tax bill, making it easily transferable upon sale of the building. Plus, projects can be retroactively financed for up to three years after improvements are completed.
Specialty Finance Companies: Mission-driven non-profit lenders, CDFIs, green banks. These lenders are leading the transformation of the lending market by underwriting savings and providing mid-cycle financing products for energy efficiency, clean energy and building decarbonization. They provide 10-20 years loans with limited security that is subordinate to mortgage debt and provide a variety of loan products for construction and permanent financing as well as predevelopment loans and bridge loans to incentive payments. The loans are often well-suited to whole building decarbonization projects and provide an alternative to C-PACE financing when it's not a fit.

Equipment loans: These loans are offered by lenders, vendors, and contractors to purchase equipment. Equipment loans offer a simple and quick process to cover emergency repairs or when mortgage refinancing is not an option. They typically have short terms with limited upfront fees, but rates can be high depending on the borrower’s credit history or outstanding debt. Lenders can also offer equipment leases allowing building owners to use energy-related equipment without purchasing it. Upfront expenses or maintenance fees are not required, and an option to purchase the equipment at the end of the lease term is offered.

Non-debt solutions: These are consolidated, simplified “turnkey” options that require no upfront cost to the owner. They consist of a service contract which is often paid using energy savings and sometimes includes guarantees on savings from the provider. There are two types of no-debt solutions:

- **Energy Service Agreements** or **“As-a-Service” Agreements** are forms of non-debt financing solutions where providers finance, install, construct, maintain and manage energy retrofits and get paid over a long-term service contract. The service provider funds the project costs so the owner does not need financing. This is best suited for owners of multiple buildings or with projects larger than $500,000
- **Power Purchase Agreements** are used for on-site power generation projects, such as rooftop solar, and are useful for building owners who can’t take advantage of tax benefits. Instead of a service contract, building owners must purchase the solar energy produced usually at an attractive rate.