



FINANCING ENERGY EFFICIENCY THROUGH MORTGAGE LOANS

UNTAPPED OPPORTUNITIES FOR LENDERS AND BUILDING OWNERS

Imagine closing the deal on your next big real estate investment. The lighting upgrades, a new high-efficiency HVAC, and energy-efficient façade upgrades will elevate your investment, increase the overall value, and the costs will be rolled directly into your mortgage. This hypothetical may not be far from reality soon.

INTRODUCTION

For decades, mortgage loans have been the primary means of financing residential and commercial building ownership.¹ The lending community's use of traditional, multi-year loans for both commercial and multifamily properties alike spread costs over a long period to lessen financial burden for buyers, but until recently, building owners who sought a more energy-efficient building needed to obtain non-traditional financing and perform energy retrofits separate from a traditional mortgage. The following market analysis examines the current landscape for building owners and lenders seeking to integrate energy efficiency and utility savings into building assessments and retrofit plans, and to utilize the data to enhance traditional loans. The analysis was performed by the Institute for Market Transformation (IMT) and Lawrence Berkeley National Laboratory (LBNL), with funding from the U.S. Department of Energy (DOE). It examines real properties that successfully utilize existing programs to help building owners account for energy efficiency during mortgage underwriting, and offers guidelines for the mortgage lending community and building owners on how to roll energy efficiency retrofits into traditional mortgages in an effective and seamless manner.

TAKING THE FIRST STEP WITH BUILDING ASSESSMENTS

According to the Mortgage Bankers Association, in 2016, lenders closed \$491 billion in mortgage loans.² Despite the many benefits energy efficiency and sustainability yield for the real estate market, energy performance is frequently a distant afterthought when it comes to traditional mortgages. The industry still does not effectively incorporate energy efficiency into most commercial, multifamily, and residential loans. However, this new analysis indicates market leaders are closer than ever to marrying the two while simultaneously reducing property default risks.

Currently, only a small number of organized and/or subsidized programs exist to help building owners account for energy efficiency during mortgage underwriting. Fannie Mae runs some of the most well-known green financing programs in the multifamily sector. The Small Business Association (SBA), and smaller community development financial institutions (CDFIs), such as the Community Preservation Corporation (CPC), also run successful initiatives aimed at removing the upfront cost burden of energy efficiency retrofits and rolling them into building acquisition or loan refinancing.

The drive to incorporate energy efficiency into the core of property financing, that is—at the mortgage level, can and should be steered by the lending community. This analysis finds that while building owners, architects, technical assessors, and project managers frequently request a building assessment, also known as a property condition assessment (PCA) or a physical needs assessment (PNA), prior to acquisition or refinancing, the assessments rarely include

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the energy performance characteristics of the building. If efficiency is considered, the results are not used to inform the final loan proceeds.

A crucial way for stakeholders to integrate energy efficiency at the mortgage level is to incorporate it as a core component of building assessments. Building owners and lenders should seek PCAs that account for energy performance, introduce energy efficiency retrofits during the underwriting process, and actively engage organizations already underwriting energy efficiency. By taking this step, lenders have a unique opportunity to increase mortgage loan portfolios, reduce property default risk, and provide a needed service to building owners. Property owners stand to save on operating costs, increase their net operating income (NOI), and be able to market their green, high-performance building to prospective tenants.

THE CURRENT MARKET

Energy efficiency and traditional mortgage loans are rarely part of the same dialogue. A host of energy efficiency financing options exist for commercial building owners, including property assessed clean energy (PACE), CDFI offerings, utility incentive programs, energy service companies (ESCOs), and a variety of smaller loan programs. Through the [Better Buildings Initiative](#), DOE has made a concentrated effort in recent years to incorporate financing discussions into the broader building efficiency dialogue. And there is no shortage of multinational banks offering traditional mortgage loans for commercial, multifamily, and residential properties. The inherent missing link in the mortgage market is consideration of energy efficiency in the mortgage underwriting process. In leaving energy efficiency out of property assessments and mortgage underwriting, lenders are missing the opportunity to grow their loan portfolios, reduce risk of default,³ and lower environmental impact.

A 2016 [survey](#) conducted by IMT with support from DOE suggested that there is a high level of interest among lenders to include energy efficiency in PCAs. As a follow-up to this scoping study, and to learn what market leaders are saying about energy efficiency financing, IMT and LBNL asked over 70 companies and individuals if they, or their company, took energy efficiency into consideration during a PCA, and if they used that information to augment the permissible loan amount. Put simply, we wanted to know if the industry was using energy audits to inform mortgage financing decisions.

Among those contacted were real estate companies, multinational banks, small banks, green banks, architecture firms, appraisers, and CDFIs. Out of the 73 institutions contacted, only five indicated that they use a building's energy performance to inform loan value. Those companies or institutions that reported considering energy efficiency at the financing or underwriting level did so only as part of a larger national program or product. Notable existing programs or lending institutions include the following: Fannie Mae Green Rewards, Community Preservation Corporation (CPC), and the Small Business Association's (SBA) CDC/504 Loan. Each of these programs are profiled in this analysis.

While the majority of institutions we contacted do not actively consider energy efficiency during their financing or PCA processes, a notable few expressed intention to update their practices in medium-term corporate planning. Some forward-thinking real estate corporations are beginning to integrate energy efficiency into their business practices and encourage building owners and tenants to do the same by going back to their lenders with data on expected savings. When further examined, the analysis indicates owners are looking to non-traditional loans to finance energy efficiency projects, and likewise traditional lenders are leaving energy efficiency to third-party institutions.

A reduced default risk and higher loan proceeds are two of the multiple opportunities available when lenders take energy efficiency into consideration. The current market offerings leave owner savings on the table, detract from possible loan portfolios, and

lead to inefficient buildings. This market failure can be attributed to a lack of synchrony between owners and lenders as well as an overall misunderstanding of energy efficiency financing opportunities.

THE TRIED AND TESTED MULTIFAMILY MODEL: FANNIE MAE GREEN REWARDS

Perhaps the best known energy and water efficiency financing option available to multifamily communities is the Green Rewards program run by Fannie Mae, one of the leading financial institutions in the U.S. Throughout the first quarter of 2017, Fannie Mae created a \$9 billion loan portfolio. Within this portfolio, multifamily properties that target a 20 percent or higher reduction in annual energy or water use are eligible to receive a lower interest rate, increased loan proceeds, and an energy audit. This translates into utility savings for both tenants who pay their own bills, and building owners who pay the mortgage and/or portions of tenant utility costs. The loans are issued to the market as “Green Mortgage Backed Securities,” creating a new investment vehicle for environmental, social, and governance (ESG) investors. Given a steady increase in program participation over the last two years, these numbers indicate an upward trajectory in multifamily property owners’ awareness of energy efficiency and a growing desire to capitalize on its benefits.

Securing a Fannie Mae Green Rewards loan is not complicated, but it does require coordination between multiple actors. Below are two properties that have undergone ASHRAE Level 2 audits as the initial step in their goals to receive financing via the Fannie Mae Green Rewards program.⁴ Both of these properties entered into multi-million dollar loans financed by Fannie Mae. Table 1 outlines each building’s profile and energy consumption prior to completing any energy conservation measures (ECMs).

Typically, technical energy assessments by PCA firms generate a large number of easily implemented ECMs, such as swapping out inefficient lights (i.e. incandescent or fluorescent for LED varieties), as well as a number of more complex and expensive measures, such as installing new HVAC systems and controls. Under the Green Rewards program, participants must make improvements that target a 20 percent reduction in energy or water consumption. The improvements must be installed within 12 months

TABLE 1: ASHRAE LEVEL 2 AUDIT⁵

	BUILDING #1	BUILDING #2
Location	Newark, Del.	Chicago, Ill.
Building Profile	Mid-rise, 27 buildings each w/ 3-4 stories, 358 units	High-rise, 1 building w/ 33 stories, 263 units
Year Built	1974	1991
Total Area (Sq/ft)	368,705	291,435
Previous Annual Energy Consumption	33,958,820 kBtu	18,882,169 kBtu
Previous Annual Energy Costs	\$597,384	\$160,170

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Given the scope of possible retrofits under the Fannie Mae Green Rewards program, it leads the market in versatile multifamily energy efficiency savings.

of loan origination.⁶ Borrowers are also required to report on annual energy metrics, including an ENERGY STAR score. Table 2 outlines how many ECMs were recommended for both profiled buildings. In the case of Building #1, the following specific ECM recommendations included:

- **Replace all incandescent/halogen/CFLs in all apartments.** Projected initial investment of \$61,320 for a total estimated annual cost savings of \$50,590 (representing a 1.2 year simple payback).
- **Reduce HVAC hours of operation in most apartments** (one apartment model excluded). Projected initial investment of \$57,235 for a total estimated annual cost savings of \$15,885 (representing a 2.8 year simple payback).
- **Replace existing air conditioners with ENERGY STAR air conditioners in most apartments** (one apartment model excluded). Projected initial investment of \$785,575 for a total estimated annual cost savings of \$49,485 (representing a 15.9 year simple payback).⁷

While Building #2 had fewer ECMs, they still spanned a variety of prices and equipment types. The following are some examples of recommended ECMs:

- **Replace existing linear fluorescent lamps in common areas.** Projected initial investment of \$4,613 for a total estimated annual cost savings of \$2,188 (representing a 2.1 year simple payback).
- **Replace existing communal washing machines with ENERGY STAR certified washing machines.** Projected initial investment of \$59,562 for a total estimated annual cost savings of \$4,886 (representing a 12.2 year simple payback).
- **Replace inefficient heating plant in mechanical room.** Projected initial investment of \$274,776 for a total estimated annual cost savings of \$18,294 (representing a 15 year simple payback).

Given the scope of possible retrofits under the Fannie Mae Green Rewards program, it leads the market in versatile multifamily energy efficiency savings. Its proven track record in the sector makes it the best model for a commercial and retail equivalent. Fannie Mae continues to track performance data as the program grows in order to compare default rates for green loans to standard loans.

TABLE 2: ECM PREDICTIONS⁸

	BUILDING #1	BUILDING #2
Number of ECMs suggested	17	10
Net Initial ECM Investment	\$4,442,797	\$465,202
Estimated Annual Cost Savings	\$284,784	\$66,321
ECM Effective Payback	15.6 years	7 years

NON-TRADITIONAL BANK FINANCING: THE COMMUNITY PRESERVATION CORPORATION

Typically, private corporations and publically-traded entities dominate mortgage financing proceedings and nonprofits do not play a substantial role. This makes the work of the New York City-based Community Preservation Corporation (CPC) particularly noteworthy. CPC, a nonprofit affordable housing organization and CDFI, has pioneered a method of providing additional capital for sustainability improvements by incorporating future expense savings into the mortgage underwriting process. With such prevalent influence over the economics and condition of their housing stock, CPC recognizes the lending industry has a tremendous opportunity to take the lead in advancing measures that will not only improve loan performance and mitigate risks, but also improve the financial and physical quality and sustainability of the built environment. By taking a more holistic view of underwriting energy and water efficiency, CPC opened the door for multifamily property owners to not only retrofit their lighting, plumbing, and HVAC equipment, but also renovate their buildings and fold the costs and associated risks directly into their first mortgages.

CPC recognizes significant opportunity for efficiency improvements in the residential housing sector, which is responsible for 35 percent of NYC's greenhouse gas emissions.⁹ Since the program's inception, many of CPC's buildings boast substantial energy savings financed through mortgage loan proceeds, or for more sizable renovations, construction loans. CPC is unique in its focus on both mortgage and construction loans and also in its organization-wide support of efficiency. As part of new employee training, all staff are taught the benefits of efficiency and opportunities to integrate energy and water savings into each loan product the company offers. Additionally, CPC building owners are encouraged to obtain an energy audit or integrated property needs assessment (IPNA) in order to benchmark and analyze energy usage prior to project implementation and to identify cost saving measures.¹⁰

A benchmark example of CPC's successful approach is a multifamily walk-up located in NYC's Washington Heights neighborhood. This 1920's apartment building has 35 units that span six floors for a total of 34,600 square feet (sq ft). CPC provided \$1.4 million in construction and mortgage financing to support a roof-to-cellar renovation, which included an energy and water retrofit. The scope of work included the following; new low-e windows, replacement of all incandescent and T12 fluorescent lights with LEDs, installation of low-flow showerheads and faucets, replacement of inefficient refrigerators (800 kWh/year) with ENERGY STAR models (386 kWh/year), and a complete heating and domestic hot water system upgrade.

As a result of the comprehensive energy retrofit the property went through, it reduced its annual utility cost by \$23,000. Prior to the overhaul, the owner historically spent about \$2,210 per apartment on annual utility expenses (i.e. heating, water,

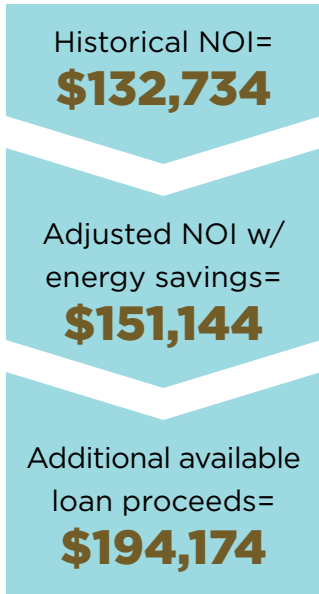


Multifamily walk-up in Washington Heights neighborhood, NYC.

CPC

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**TABLE 3:
ADDITIONAL
LOAN PROCEEDS
DIAGRAM**



Data courtesy of CPC

CPC construction and mortgage financing allowed for a complete heating and domestic hot water system upgrade.

electricity). Post-retrofit that cost decreased to \$1,540 per apartment, representing an annual savings of roughly 30 percent.

Building owners can generally expect CPC to underwrite up to 50 percent of projected future savings when factoring in energy efficiency upgrades. Underwriting a portion of projected energy savings allows owners to leverage savings to obtain additional loan proceeds. Efficiency savings beyond this conservative underwriting creates additional, ongoing cash flow to the borrower. Table 3 represents the increase in NOI and the additional loan proceeds made available for this project by underwriting future savings. CPC's underwriting method and services, while only available in the state of New York, could conceivably be scaled to other states and represents a model worth replicating.

ALTERNATIVE FINANCING: SMALL BUSINESS ASSOCIATION CDC/504 LOAN

The third existing product IMT and LBNL examined is the Certified Development Company (CDC)/504 loan from the Small Business Association (SBA). This loan program is the only one of the three available to non-residential properties. While most SBA loans are around \$300-400,000,¹¹ this special community-focused loan can be up to \$5.5 million; an undeniably significant amount to most small businesses. Under CDC/504, building owners can receive increased loan proceeds when requirements in categories including, job creation, public policy, and/or small manufacturing are met. One way to meet the public policy criteria is to demonstrate 10 percent energy savings through efficiency or renewable energy offsets. Unique in both its size and energy efficiency focus, the SBA CDC/504 loan program has allowed building owners to obtain some of the largest loans available to small businesses, and to ensure that they operate in an energy-efficient space.

For example, in Naperville, Ill., Brighton Car Wash operates a full-service car wash that provides vacuuming, an automated wash tunnel, recycling pumps, auto detail, and client waiting areas. Operating seven days a week, Brighton Car Wash is open for roughly 3,800 hours annually. Given the energy-intensive nature of the equipment required to run a car wash, the business was a prime candidate for obtaining an SBA CDC/504 loan to increase its energy efficiency. For the business to achieve its savings goals, it brought in Green Light National, an ESCO located in Chicago that offers turn-key retrofits to small businesses, many of which are seeking an SBA CDC/504 loan.

Green Light National worked with Brighton Car Wash to tackle manageable and affordable lighting retrofits, as well as provided historical data and technical expertise on solar power generation, HVAC upgrades, and variable frequency drive (VFD) motor retrofits. Prior to retrofitting the lights, the business' monthly energy usage was 16,086 kWh. After old and inefficient lights were replaced by LEDs, its total monthly energy consumption went down to 13,684 kWh. Additionally, the solar power from photovoltaic (PV) panels located on the roof now generates enough energy to result in an approximate annual reduction of 8,500 kWh. The business also committed to ongoing HVAC maintenance which further reduces energy usage by



maintaining a fully operational and efficient system. When all measures were implemented and operational, Brighton Car Wash reduced grid electrical consumption by 15 percent and total energy consumption by nearly 13 percent. Both figures put the business in excess of the ten percent minimum energy savings required to obtain the SBA CDC/504 loan.

Another small business located in Illinois reached out to Green Light National as it sought to relocate its headquarters to a more energy-efficient space. Instead of retrofitting its old space, the company needed to relocate in order to improve efficiency of its industrial warehouses. While the old facility was just over 30,000 sq ft, the new building spanned close to 95,000 sq ft. Green Light National was still able to reduce energy consumption in the new space by 17 percent, far above the 10 percent minimum. The retrofits proposed and implemented by Green Light National included LED lighting, reduction of overall operating time by over 4,300 hours annually, and increased building envelope insulation. Prior to the retrofits, the company was using 2.79 kWh in combined monthly energy use per sq ft. After improvements were made, that number dropped to 1.55 kWh per sq ft. By demonstrating these successes, Green Light National propelled another small business to a larger loan, which led to a higher-performing, more energy-efficient building. One vital distinction between CPC and the SBA CDC/504 loan program is that the latter is not truly underwriting to savings in the same capacity as CPC. Both CPC and SBA CDC/504 allow owners to obtain a larger loan and energy efficiency retrofits, but only the former truly underwrites with regards to savings.

OUTLOOK AND OPPORTUNITIES FOR LENDERS AND OWNERS

IMT is working with cities across the country to expand [energy and water benchmarking programs](#) and policies. This has led to greater access to building energy performance information and a better understanding of the value of high-performance buildings for both building owners and lenders. Spurred by policy implementation and market engagement, other countries are also beginning to make the transition to energy efficiency mortgage underwriting. Late last year, legislation that initially passed in 2009¹² in Scotland took effect. It states that acquired or refinanced buildings must comply with a set of building regulations and energy efficiency standards. Any building not complying with the existing standards must produce an “action plan” in which it draws up an intent to meet them. Scottish real estate companies are now familiar with implementing an action plan, calculating costs, and following this up with financing methods and energy audits as needed.

With the combination of promising financing mechanisms such as PACE and ESCO offerings, in addition to CDFIs, the SBA, and other products mentioned in this report, the outlook for energy efficiency financing in the United States is encouraging. On the surface, these existing programs and institutions provide valuable additions to current market offerings and are allowing small businesses, building owners, and lenders across sectors to seek innovative ways to fund building improvements. However, none of these programs truly capitalize on all the opportunities that exist when commercial lenders roll energy efficiency costs directly into a mortgage. CPC and Fannie Mae have made strides to revolutionize the way lenders and building owners view energy efficiency in multifamily properties, but so far the market has been slow to translate that to commercial, retail, and office spaces. In some cases, applying these principles to commercial mortgages could result in even higher paybacks and financial security than in the multifamily sector.

We recommend the following steps to ensure energy efficiency is considered in commercial mortgages:

OPPORTUNITIES FOR LENDERS

- **Require energy audits as part of a larger building assessment (i.e. PCA/PNA) and appraisal.** This identifies the case-by-case opportunities where loans may be

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increased and risk mitigated and ensures energy efficiency is as much a consideration as any other building feature.

- **Banks and lending institutions should design and implement specific business strategies and loan products** to finance energy retrofits through the mortgage loan (like those of the above profiled institutions). To improve uptake, these loan products should be tailored to specific markets, similar to CPC, Fannie Mae, and SBA products.
- **Include energy efficiency education** as a core value for lenders.

OPPORTUNITIES FOR BUILDING OWNERS

- **Ask mortgage lenders about financing energy efficiency in loans.** Without both parties taking an active role in underwriting energy efficiency, retrofits are far less likely to happen.
- **Seek out PCA firms that incorporate energy efficiency,** or ask existing firms to include an energy audit during building assessment.

Our findings show that buildings successfully underwriting energy efficiency are limited, but the ones that have done so have seen increased NOI, reduced energy consumption, and/or increased tenant energy savings. The Fannie Mae Green Rewards program and CPC demonstrate that tenants can successfully pay off these costs via a traditional mortgage loan model. Furthermore, building owners who roll energy efficiency upgrades into traditional mortgages can consolidate their negotiations and receive earlier access to capital. Existing green financing programs prove that simple performance requirements and clear returns are what the market desires in order to spur further action on energy efficiency underwriting. While underwriting additional loan proceeds based directly off of energy efficiency savings remains underused, it represents one of the soundest financing options lenders can take.

NOTES

1. For this analysis, commercial is defined as non-residential properties such as offices and retail spaces *Wall Street Journal*, April 11, 2017. <https://www.wsj.com/articles/lending-for-commercial-property-falls-as-investors-pull-back-1491903008>
2. *Impact of Energy Factors on Default Risk in Commercial Mortgages*, University of California Berkeley and Lawrence Berkeley National Laboratory. <https://cbs.lbl.gov/sites/all/files/docs/Mortgage%20Default%20Risk%20and%20Energy%20Technical%20Report%205-12-17.pdf>
3. EMG Corporation carried out the aforementioned audit and all data has been supplied with their permission.
4. All data courtesy of EMG Corporation, dollar amounts in current USD as of May 2017.
5. Fannie Mae Green Rewards. https://www.fanniemae.com/content/fact_sheet/greenrewards.pdf
6. Note that if the air conditioners need to be replaced in the near term, the "net" payback would be reflected against the premium for the more efficient unit, not the entire cost of equipment.
7. All data courtesy of EMG Corporation, results indicate if client applies all ECMs.
8. Community Preservation Corporation website, <http://communitycp.com/initiatives/>
9. According to the Department of Housing and Preservation Development (HPD) and Housing Development Corporation (HDC), the IPNA builds upon the GreenPNA (GPNA). <http://www1.nyc.gov/site/hpd/about/press-releases/2017/05/05-10-17.page>
10. The average SBA 7a loan in 2015 was \$371,628. <https://www.sba.gov/loans-grants/see-what-sba-offers/sba-loan-programs/general-small-business-loans-7a/7a-loan-amounts-fees-interest-rates>
11. Assessing and improving our existing non-domestic buildings—section 63 of The Climate Change (Scotland) Act 2009. <http://www.gov.scot/Topics/Built-Environment/Building/Building-standards/S63>

