

Freddie Mac Multifamily
Green Bond Framework
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I. Introduction

Freddie Mac's mission is to provide liquidity, stability and affordability to the U.S. housing market. Supporting affordable housing and access to credit is integral to what we do. In 2016, we added to that core business a strong focus on energy and water efficiency through our Green Advantage[®] program. Our program is revolutionizing the financing of energy and water efficiency retrofits in the U.S. rental housing market.

Freddie Mac

Freddie Mac is a government-sponsored enterprise chartered by Congress in 1970 to support housing through the secondary market (we do not originate loans or lend money directly to mortgage borrowers). We support housing primarily by purchasing residential mortgage loans that originate with lenders. In most instances, we package these loans into mortgage-backed securities, which carry our guarantee. These securities are then sold in the global capital markets. We also invest in mortgage loans and mortgage-related securities.

Freddie Mac is committed to best practices in corporate governance. The board of directors regularly reviews Freddie Mac's governance practices, assesses the regulatory and legislative environment and adopts governance practices that are in the best interests of the company. The board of directors has adopted Corporate Governance Guidelines that are reviewed annually and are available on the Freddie Mac website, <http://www.freddiemac.com>. The Guidelines reflect corporate governance practices and include: qualifications for directors, a limitation on the number of boards on which a director may serve, term limits, director orientation and continuing education, and a requirement that the board and each of its committees perform an annual self-evaluation. We regularly review our practices to ensure effective collaboration of management and the board.

Since 2008, Freddie Mac has been operating in conservatorship, with the Federal Housing Finance Agency (FHFA) as conservator. FHFA is also our regulator. We are working with FHFA, our customers and the industry to build a better housing finance system for the nation.

Freddie Mac Multifamily

The Multifamily division of Freddie Mac helps to address affordable rental housing needs by purchasing mortgages secured by apartment buildings with five or more units. We enable the purchase, refinancing and rehabilitation of older multifamily buildings and the permanent financing of recently built multifamily buildings. We buy mortgages secured by these buildings from the Freddie Mac OptigoSM Network, which has over 150 branches nationwide. Since 1993, Freddie Mac's Multifamily business has provided over \$603 billion in financing for approximately 85,000 multifamily properties. As of December 31, 2018, Freddie Mac had a multifamily whole-loan portfolio of \$35 billion, a multifamily investment securities portfolio of \$7 billion and a multifamily guarantee portfolio of \$237 billion.

In 2009, Freddie Mac Multifamily introduced its K Series platform that aggregates and securitizes newly originated multifamily loans made through the Freddie Mac Optigo Network.

In 2016, the Green Advantage program was developed. It is overseen by Freddie Mac's Multifamily cross-divisional Green committee, comprising representatives from various Multifamily lines of business: production, underwriting, credit policy, asset management, capital markets and legal. Members of this

committee have deep expertise in all aspects of financing multifamily development and experience with energy and water efficiency retrofits, energy and water audits, industry standards and property benchmarking.

II. Green Advantage Program Objective: Environmental and Social Impact

The need for affordable rental housing is greater than ever. This need is especially acute near major employment centers where the cost of housing has soared. Additionally, U.S. rental housing is aging with over 77% of units having been constructed prior to 2000. As the units age, they become less energy efficient and tenants living in these units pay, on balance, more in utilities than renters in newer units.

Freddie Mac identified the need to improve rental housing to benefit tenants through lower monthly expenses and the environment through reduced water and energy consumption. In August 2016, we introduced our Green Advantage program to the marketplace. Our objective was, and continues to be, to lower expenses for workforce housing tenants while incentivizing borrowers to make energy and water efficiency improvements. Through our flagship Green Advantage option, known as Green Up[®] and Green Up Plus[®], we have made substantial progress toward this objective. The options provide financing incentives for borrowers who choose to make energy and water consumption reduction improvements at their properties and require the borrowers to monitor and report on energy and water consumption over time. The options are designed to generate energy and water efficiency improvements in workforce housing and do not benefit properties that already qualify as green.

The options have been extremely well received in the market. From the program's inception through the end of 2018, over 450,000 units across approximately 1,600 properties were financed with Green Up and Green Up Plus loans, totaling over \$44.7 billion in loans. In addition to energy and water savings, we are tracking the ongoing results and progress of these properties and gaining valuable data for future study. Freddie Mac is the largest secondary market that supports energy and water efficiency improvements in workforce housing since the inception of the program through 2018.

The Green Bond Principles (GBP), as administered by the International Capital Markets Association, are voluntary process guidelines for best practices when issuing Green Bonds. The GBP recommend transparency, disclosure and promote integrity in the Green Bond market. The Freddie Mac Multifamily Green Bond Framework is aligned with the four core components of the GBP as described in this Freddie Mac Green Bond Framework document.

III. Use of Proceeds

The proceeds of Freddie Mac’s Green Bonds are used to finance both the Green Up and Green Up Plus loans that serve as collateral in our KG Certificates – our environmental and social impact K-Deal series – and may be included in other K-Deals, Participation Certificates (PCs) or similar transactions. Freddie Mac intends to leverage our K-Deal structure, which is a regularly issued, structured pass-through security backed by multifamily mortgage loans to issue Green Bonds that meet our green selection criteria. More information regarding the terms of K-Deal series transactions is available in the [K-Deal Program Term Sheet](#).

	Green Up®	Green Up Plus®
Minimum Projected Consumption Reduction ¹	30% of energy or water/sewer consumption for the whole property, with a minimum of 15% from energy, based on Green Assessment®	30% of energy or water/sewer consumption for the whole property, with a minimum of 15% from energy, based on Green Assessment Plus®
Underwriting Approach ²	Recognize up to 50% of projected owner-paid energy and/or water/sewer savings based on Green Assessment	Recognize up to 75% of projected owner-paid energy and/or water/sewer savings based on Green Assessment Plus
Time to Complete Green Improvements	2 years to complete	2 years to complete
Escrow Requirements	Funds for energy/water efficiency work will be escrowed at 125% of cost and released as work is completed	Funds for energy/water efficiency work will be escrowed at 125% of cost and released as work is completed
Required Third-Party Reports	Green Assessment	Green Assessment Plus
Benchmarking Data Collection ¹	Green Up and Green Up Plus loans require borrowers to engage a third-party data collection consultant, prior to the origination of the loan, to collect, input and monitor actual energy and water usage through the term of the loan.	

- (1) In 2019, FHFA made the following [requirement changes](#) for Green Up and Green Up Plus loans to be excluded from the multifamily cap: (i) Green Up and Green Up Plus- which previously needed a minimum projected consumption reduction of 25% energy or water consumption for the whole property based on the Green Assessment or Green Assessment Plus – must now have a minimum projected consumption reduction of 30% in whole property energy and water consumption, of which 15% reduction must be in energy consumption; and (ii) borrowers, who had been able to elect whether to retain a third-party data collection consultant, must now retain the third-party data collection consultant for the term of the loan.
- (2) Based on the historical eligible green loan production, we have rarely utilized this expense adjustment.

IV. Process for Project Evaluation and Selection

In general, K-Deals are backed by newly acquired mortgages underwritten to Freddie Mac’s industry-leading underwriting standards. Underwriting and credit reviews are completed by Freddie Mac, and securitized loans are underwritten to the same standards as loans held in our investment portfolio. Eligible green mortgage loans need to satisfy the following underwriting criteria described in the [Green Advantage Term Sheet](#), included in the Appendix. Eligible green mortgage loans must also satisfy the requirements documented in the Freddie Mac Multifamily Seller/Servicer Guide. The borrower must obtain either a Green Assessment or Green Assessment Plus, which provides a property analysis with recommended property improvements that can save water and energy. Borrowers select improvements from the Green Assessment or Green Assessment Plus, as applicable, that will meet the required savings thresholds.

The Green Assessment or Green Assessment Plus must be produced by a qualified Green Consultant. General requirements created by Freddie Mac for a Green Consultant include experience completing energy and water audits, understanding of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards and familiarity with energy and water benchmarking. Green Consultants must also have an industry recognized professional certification demonstrating their proficiency in energy and water audits and analysis. A summary of the Green Assessment and Green Assessment Plus is below:

<p style="text-align: center;">Green Assessment</p>	<p>A report detailing proposed property-level improvements to promote utility consumption efficiency at the property. It uses the ASHRAE Level 1 standard plus additional specific and rigorous inspection and consumption data requirements. The report describes projected savings in terms of utility consumption and dollars saved per improvement item.</p>
<p style="text-align: center;">Green Assessment Plus</p>	<p>A highly detailed property analysis based on an ASHRAE level 2 energy audit.</p>

V. Management of Proceeds

Green Bond issuances will be designated through the KG-Deal program and may be included in other K-Deals, PCs or similar transactions. Green Bond proceeds are reported monthly by the master servicer and trustee as part of the standard Investor Reporting Package.

For a majority of the Green Up and Green Up Plus mortgages used to back an issued Green Bond, the borrower typically establishes a repair reserve account with the lender in the Freddie Mac Optigo Network (Optigo lender) and deposits funds into such account to be used for the purpose of implementing energy and/or water efficiency improvements meeting the required savings thresholds (Green Improvements) at

the property. Funds are typically escrowed at 125% of the estimated cost of the Green Improvements and may be used solely to defray the costs of the Green Improvements.

Borrowers have up to two years to complete the Green Improvements and must submit a certification that the improvements were made in accordance with Green Consultant recommendations. Optigo lenders' servicing team monitor the completion of the Green Improvements and will only disburse the escrowed funds after reviewing evidence, such as lien waivers, copies of canceled checks, receipts, paid invoices, color photographs, etc. that the work for which disbursement is requested has been fully completed by the borrower and was completed in a good and workmanlike manner. As part of a property's annual inspection, Optigo lenders' servicing team also check the completed work to ensure compliance with the terms of the loan documents.

VI. Reporting

Freddie Mac is committed to reporting to the investors the asset level and portfolio level performance for green bonds backed by properties financed using our Green Advantage program. The reports are intended to be consistent with the core principles and recommendations in "Green Bonds- Working Towards a Harmonized Framework for Impact Reporting (December 2015)".¹

Asset Level Reporting

Freddie Mac collects and will report on property level performance data associated with the energy and water efficiency improvements to be implemented for Green Up or Green Up Plus options.

In connection with a borrower's application for a loan from the Optigo lender, Green Consultants meeting Freddie Mac's qualification requirements prepare a Green Assessment or Green Assessment Plus. These provide the borrower with the specifications, quantities, costs, savings and payback calculations necessary to decide which improvements it can implement to achieve increased energy and water efficiency at its property in a cost-effective way. The Green Consultant collects historical utility consumption data for the whole property (common and individual tenant areas) and assesses the building conditions and the performance of equipment, fixtures and systems for energy and water consumption at the property. We collect the data contained within the Green Assessment and Green Assessment Plus reports and use it for analysis and reporting. Examples of this data include:

- Type of savings pursued (energy, water or both)
- Green improvement measures recommended and selected by borrowers
- Projected savings of measures
- Estimated costs of measures
- Performance metrics (ENERGY STAR® Score, EPA 1-100 Water Score (Water Score), Energy Use Intensity, Water Use Intensity)

Green Consultants also input the collected historical and estimated property consumption data into ENERGY STAR Portfolio Manager® (Portfolio Manager), a free online tool maintained by the Environmental Protection Agency (EPA), and share that data with Freddie Mac in the tool. The data entered into Portfolio Manager establishes baseline periods for energy and water consumption for the

¹ <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/20151202-0530-FINALRevised-Proposal2.pdf>

property. Even though loans may be securitized, borrowers are required to provide Freddie Mac with the actual energy and water usage (Benchmarking Data) at the property through Portfolio Manager through the term of the loan.

As of 2019, all borrowers must engage a qualified third party to collect and report on Benchmarking Data. Prior to 2019, borrowers could choose to enter the data on their own or engage a third party. As we receive the ongoing consumption data over time, we plan to engage a third-party expert (WegoWise by AppFolio) to compare the Benchmarking Data with the baseline to better understand the realized efficiencies at the property in relation to the upfront projections.

In December 2018, we released a report available on Freddie Mac's website entitled, "Green Improvements in Workforce Housing"², which analyzed our portfolio of loans where borrowers elected to pursue energy and water efficiency improvements. This report contained a dataset of property level data on the types of improvements made and projected savings. Through this report, dataset and our planned annual updates, we are filling a gap in the market, which currently lacks energy and water efficiency data for multifamily properties.

Portfolio Level Reporting

Freddie Mac evaluates the portfolio level performance data associated with properties financed using our Green Up and Green Up Plus options. Portfolio level evaluation focuses on the evolution of our green lending platform and the financial, environmental and social impacts to sustainability.

Financial impact analysis includes factors such as total loan count, loan amount, unit affordability, cost of improvements and projected savings in dollars.

Where feasible, **environmental impacts** are evaluated and may include aggregate energy consumption and water savings figures. We will also explore potential impacts of loans in drought areas, energy constrained areas and greenhouse gas emissions reduction/avoidance.

Social impacts include analysis of tenant benefits to the improvements and associated cost savings. This financing can be used as a tool to improve housing affordability by helping to reduce tenant utility costs.

Our *Green Improvements in Workforce Housing* report was part of a series that focused on underserved markets. The purpose of this report was to strengthen and improve green practices in the broader multifamily market and provide insights into the types of improvements that can cost effectively reduce both consumption and tenant expenses. We intend to update the Green Improvements in Workforce Housing report annually.

Investor Reporting

Green Bond information will be made available through either the Multifamily Securities Investor Access tool³ or through a Security Lookup tool⁴, both available on the Freddie Mac website. We intend to include performance metrics such as ENERGY STAR Score, Water Score, Energy Use Intensity and Water Use Intensity when available.

We also intend to publish an annual report summarizing our Green Bond activities. This annual report will provide a breakout of eligible Green Bond investments and allocations to each investment category

² <https://mf.freddiemac.com/docs/green-improvements-workforce-housing.pdf>

³ <https://fm-msia.com/>

⁴ https://mf.freddiemac.com/investors/sd_remic_lookup.html

and will highlight the programmatic activities and impacts tied to Green Bonds and our Green Advantage financing.

External Review

Data Quality Assessment

To better understand the quality of the data received from the Green Reports, we engaged a third-party consultant, WegoWise by AppFolio, to perform an analysis of a sample of the loans in our portfolio. This analysis focused solely on historical consumption data provided by the borrowers and entered into Portfolio Manager by the Green Consultants. It did not include actual ongoing consumption data. The analysis was focused on developing an understanding, at both a property and a portfolio level, of our ability to measure and report on energy and water savings based on the data received.

The data quality assessment found the data quality acceptable for ongoing analysis. Our understanding of realized energy and water savings will be limited due to the current data collected, so analysis of savings is based only on projected savings. As we begin to gather more ongoing utility consumption, particularly after borrowers complete their improvements, we will perform additional analysis on the impacts of the improvements to the property, tenants and owner.

Future engagements with WegoWise by AppFolio are planned in order to evaluate Benchmarking Data received at the asset level with the objective of gaining a better understanding of the realized energy and water savings. We will continue assessing the data quality received at origination, after loan funding and at Green Bond issuance to make program improvements wherever possible to improve our understanding of results and impact.

Second Opinion

Freddie Mac is engaging an independent third party, Center for International Climate and Environmental Research (CICERO) to evaluate our Green Bond Framework. We intend to publish this opinion on our Freddie Mac Multifamily website, <https://mf.freddiemac.com>, and in our KG-Deal offering documents and may be included in other K-Deals, PCs or similar transactions offering documents.

Appendix

I. Green Advantage Term Sheet

	Green Up	Green Up Plus
Minimum Projected Consumption Reduction¹	30% of energy or water/sewer consumption for the whole property, with a minimum of 15% from energy, based on Green Assessment	30% of energy or water/sewer consumption for the whole property, with a minimum of 15% from energy, based on Green Assessment Plus
Underwriting Approach²	Recognize up to 50% of projected owner-paid energy and/or water/sewer savings based on Green Assessment	Recognize up to 75% of projected owner-paid energy and/or water/sewer savings based on Green Assessment Plus
Loan Proceeds/Sizing	<ul style="list-style-type: none"> Debt Coverage Ratio (DCR): -0.05x of policy-compliant DCR. Subject to lesser of 1.20x or program/product limit Loan-to-Value (LTV) ratio: +5.0% of policy-compliant LTV. Subject to greater of 85% or program/product limit 	<ul style="list-style-type: none"> DCR: -0.05x of policy-compliant DCR. Subject to lesser of 1.20x or program/product limit LTV: +5.0% of policy-compliant LTV. Subject to greater of 85% or program/product limit
As-Is DCR/LTV	<ul style="list-style-type: none"> DCR: -0.05x of policy compliant DCR Subject to lessor of 1.20x or product limit LTV: +5.0% of policy compliant LTV Subject to greater of 85% or product limit 	<ul style="list-style-type: none"> DCR: -0.05x of policy compliant DCR Subject to lessor of 1.20x or product limit LTV: +5.0% of policy compliant LTV Subject to greater of 85% or product limit
As-Improved DCR/LTV (If Applicable)	<ul style="list-style-type: none"> Must meet policy compliant DCR/LTV; no adjustments Based on As-Improved NOI and As-Improved appraised value 	<ul style="list-style-type: none"> Must meet policy compliant DCR/LTV; no adjustments Based on As-Improved NOI and As-Improved appraised value
Time to Complete Green Improvements	2 years to complete	2 years to complete
Escrow Requirements	Funds for energy/water efficiency work will be escrowed at 125% of cost and released as work is completed	Funds for energy/water efficiency work will be escrowed at 125% of cost and released as work is completed
Required Third-Party Reports	Green Assessment	Green Assessment Plus
Benchmarking Data Collection¹	Green Up and Green Up Plus loans require Borrowers to engage a third-party data collection consultant, prior to the origination of the loan, to collect, input and monitor actual energy and water usage through the term of the loan.	

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(2) Based on the historical eligible green loan production, we have rarely utilized this expense adjustment.

II. Glossary of Defined Terms

Green Consultant

A Green Consultant performing inspections must have the following qualifications to support the required energy and water analysis:

- a. Targeted training in the identification and recording of energy and water information for related systems and equipment, and the documentation of building operations and envelope information
- b. Completion of at least five inspections for energy water audits over the past two years

The Green Consultant completing the energy and water analysis must have the following qualifications:

- a. Two years of experience with energy and water audits and the successful completion of a minimum of 10 energy and water audits for multifamily properties in the past two years
- b. Familiarity with the guidelines for Level 1 and Level 2 audits as provided by ASHRAE
- c. Familiarity with Portfolio Manager
- d. At least one of the following professional designations:

- 1) Certified Energy Manager® or Certified Energy Auditor as certified by the Association of Energy Engineers
- 2) Multifamily Building Analyst as certified by the Building Performance Institute
- 3) High-performance Building Design Professional as certified by ASHRAE
- 4) Building Energy Assessment Professional as certified by ASHRAE

The Green Consultant may not be affiliated with the borrower, the Optigo lender, a buyer or seller of the property, or engaged in any business that might present a conflict of interest. The Green Consultant may not be engaged to perform any repair or remedial work specified in the Green Assessment or Green Assessment Plus.

WegoWise by AppFolio

A third-party firm specializing in utility data collection and analysis for the commercial real estate market with a focus on Multifamily.

Freddie Mac OptigoSM Network

Freddie Mac buys loans from a network of approved Multifamily lenders that have over 150 branches nationwide, substantial experience and established performance records. The small size of the network promotes quality originations and a high level of service to borrowers. Optigo lenders must comply with our standards for both origination and servicing of multifamily loans, which includes meeting minimum financial requirements and undergoing satisfactory annual audits. More information could be found on the Freddie Mac [website](#).

ASHRAE Level 1 Audit

An energy audit standard comprised of a simple audit, screening audit or walk-through audit, including interviews with on-site personnel, a review of building utility bills, and cursory calculations and analysis in order to identifying measures for improving energy efficiency.

ASHRAE Level 2 Audit

An energy audit standard meeting the ASHRAE Level 1 audit standard with a more detailed building survey of energy demand, consumption and analysis to produce a more refined recommendation for energy efficiency measures

Portfolio Manager

An online tool used to measure and track energy and water consumption at the Property. Portfolio Manager is located on the ENERGY STAR® website of the EPA.

This product overview is not an offer to sell or a solicitation of an offer to buy any Freddie Mac securities. Offers for any given security are made only through applicable offering circulars and related supplements, which incorporate Freddie Mac's Annual Report on Form 10-K and certain other reports filed with the Securities and Exchange Commission. This document contains information related to, or referenced in the offering documentation for, certain Freddie Mac mortgage securities. This information is provided for your general information only, is current only as of its date and does not constitute an offer to sell or a solicitation of an offer to buy securities. The information does not constitute a sufficient basis for making a decision with respect to the purchase and sale of any security and is directed only at, and is intended for distribution to and use by, qualified persons or entities in jurisdictions where such distribution and use is permitted and would not be contrary to law or regulation. All information regarding or relating to Freddie Mac securities is qualified in its entirety by the relevant offering circular and any related supplements. You should review the relevant offering circular and any related supplements before making a decision with respect to the purchase or sale of any security. In addition, before purchasing any security, please consult your legal and financial advisors for information about and analysis of the security, its risks and its suitability as an investment in your particular circumstances. The examples set forth above are for illustrative purposes only. Opinions contained in this document are those of Freddie Mac currently and are subject to change without notice. Please visit <https://mf.freddiemac.com> for more information.