



# Freddie Mac Green Bond Second Opinion

June 6, 2019

**Freddie Mac is a U.S. government-sponsored enterprise that supports the U.S. multifamily rental housing market.** Freddie Mac's mission is to provide liquidity, stability, and affordability to the U.S. housing market through the secondary market. In 2016, Freddie Mac Multifamily introduced the Green Advantage<sup>®</sup> program, which, among other things, offers financing incentives for energy and water efficiency retrofits.

**The Freddie Mac Multifamily green bond framework outlines eligible projects for energy and water efficiency that provide important and necessary steps towards emissions reductions and climate resilience in the U.S. multifamily rental property market.** Freddie Mac requires that qualifying borrowers invest in efficiency improvements that result in a minimum of 30% savings in energy or water consumption savings, with a minimum of 15% being for energy savings. Loans originating in 2018 may also qualify with the requirement of a lower threshold of 25% and no minimum requirement for energy savings. The 15% minimum implemented in 2019 is a good step forward but is not enough to meet global targets for emissions reductions consistent with a 2°C climate change target. The framework allows for investments in efficiency improvements of fossil fuel-based equipment such as water heaters and boilers. These represent necessary and significant short-term emissions reductions but need to be managed carefully to avoid extension of equipment lifetime that can lock in fossil fuel technology or facilitate rebound effects. The project categories are rated Light Green.

**The green assessment reports that determine loan selection and subsequent impact data are made public and subject to frequent auditing by external parties.** Funds required to complete improvements are held in escrow for up to two years. A final disbursement is made upon completion of the energy or water efficiency project as verified by the servicer of the applicable loan. Ongoing reporting of energy and water consumption is required by the borrower and/or a qualified third-party Benchmarking Data Consultant; as of 2019, all data collection must be inputted by a Benchmarking Data Consultant. This approach allows Freddie Mac to reliably collect energy and water performance data from investment properties. On reporting, Freddie Mac will estimate environmental impacts where feasible and make the aggregate energy and water savings data, as well as Energy Star and Water scores, publicly available on Freddie Mac's website. Freddie Mac does not currently measure or report against emissions reduction or climate resilience targets; however, it has provided a progressive analysis of the correlation between investments in water savings equipment and drought-prone areas.

Based on the overall assessment of the project types that will be financed by the green bonds, governance and transparency considerations, Freddie Mac's green bond framework receives an overall **Light Green shading**.

## SHADES OF GREEN

Based on our review, we rate Freddie Mac's green bond framework **Light Green**.

Included in the overall shading is an assessment of the governance structure of the green bond framework. CICERO Shades of Green (CICERO Green) finds the governance procedures in Freddie Mac's framework to be **Good**.



## GREEN BOND PRINCIPLES

Based on this review, this framework is found in alignment with the principles.

## OVERALL ASSESSMENT





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# 1 Terms and methodology

This note provides CICERO Shades of Green's (CICERO Green) second opinion of the Freddie Mac's green bond framework dated 6 June 2019. This second opinion remains relevant to all green bonds issued under the green bond framework for the duration of three years from publication of this second opinion, as long as the framework remains unchanged. Any amendments or updates to the framework require a revised second opinion. CICERO Green encourages the client to make this second opinion publicly available. If any part of the second opinion is quoted, the full report must be made available.

The second opinion is based on a review of the framework and documentation of the issuer's policies and processes, as well as information gathered during meetings, teleconferences and email correspondence with the issuer. Second opinions are restricted to an evaluation of the mechanisms or framework for selecting eligible projects at a general level. CICERO Green is not responsible for an institution's implementation of a framework, nor does it guarantee or certify the climate effects of investments in eligible projects.

## Expressing concerns with 'Shades of Green'

CICERO Green second opinions are graded dark green, medium green or light green, reflecting a broad, qualitative review of the climate and environmental risks and ambitions of the bonds. The shading methodology aims to provide transparency to investors that seek to understand and act upon potential exposure to climate risks and impacts. Investments in all shades of green projects are necessary in order to successfully implement the ambition of the Paris agreement. The shades are intended to communicate the following:

### CICERO Shades of Green



**Dark green** is allocated to projects and solutions that correspond to the long-term vision of a low carbon and climate resilient future. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Ideally, exposure to transitional and physical climate risk is considered or mitigated.



**Medium green** is allocated to projects and solutions that represent steps towards the long-term vision, but are not quite there yet. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Physical and transition climate risks might be considered.



**Light green** is allocated to projects and solutions that are climate friendly but do not represent or contribute to the long-term vision. These represent necessary and potentially significant short-term GHG emission reductions, but need to be managed to avoid extension of equipment lifetime that can lock-in fossil fuel elements. Projects may be exposed to the physical and transitional climate risk without appropriate strategies in place to protect them.



**Brown** is allocated to projects and solutions that are in opposition to the long-term vision of a low carbon and climate resilient future.

### Examples



Wind energy projects with a strong governance structure that integrates environmental concerns



Bridging technologies such as plug-in hybrid buses



Efficiency investments for fossil fuel technologies where clean alternatives are not available



New infrastructure for coal

Sound governance and transparency processes facilitate delivery of issuer's climate and environmental ambitions laid out in the framework. Hence, the governance aspects are carefully considered and reflected in the overall shading of the green bond framework. CICERO Green considers four factors in its review of an issuer's governance processes: 1) the policies and goals of relevance to the green bond framework; 2) the selection process used to identify and approve eligible projects under the framework; 3) the management of proceeds; and 4) the reporting on the projects to investors. Based on these factors, we assign an overall governance grade: Fair, Good or Excellent.



## 2 Brief description of Freddie Mac's green bond framework and related policies

Freddie Mac is a U.S. government-sponsored enterprise that supports the U.S. housing market. Freddie Mac's mission is to provide liquidity, stability, and affordability to the U.S. housing market through the secondary market. Freddie Mac Multifamily purchases mortgage loans that originate with approved lenders in its Optigo Network and packages them into commercial mortgage-backed securities (CMBS) that carry Freddie Mac's guarantee. These securities are then sold in the global capital markets. Freddie Mac does not originate loans or lend money directly to mortgage borrowers.

The Multifamily division of Freddie Mac purchases mortgages for apartment buildings with five or more units; supports the purchase, refinancing and rehabilitation of older buildings; and provides permanent financing for recently built apartments. Since 1993, Freddie Mac's Multifamily business has provided over \$603 billion in financing for approximately 85,000 multifamily properties.

In 2009, Freddie Mac Multifamily introduced its K-Series platform, which aggregates and securitizes newly originated multifamily loans made through the Freddie Mac Optigo Network. The K-series platform is a securitization program that features a regularly issued, structured pass-through security backed by a pool of multifamily mortgage loans. More information regarding the terms of K-Deal series transactions is available in the K-Deal Program Term Sheet. Freddie Mac intends to leverage the K-Deal structure to issue green bonds which will be designated through the KG-Deal program and may be included in other K-Deals, Participation Certificates or similar transactions.

### **Environmental Strategies and Policies:**

In 2016, Freddie Mac introduced the Green Advantage<sup>®</sup> program that includes the Green Up<sup>®</sup> and Green Up Plus<sup>®</sup> loan offerings (included in this green bond framework) which offer financing incentives for energy and water efficiency retrofits in the U.S. multifamily rental housing market. The goal of the Green Advantage program is to shift consumption and investment behavior of tenants and property owners towards water and energy efficiency measures. In addition to the Green Up and Green Up Plus loan offerings, the Green Advantage program includes, other incentives for green properties such as discounted loan pricing for properties with green building certifications, and green rebates for submission of an EPA ENERGY STAR Score (not included in the green bond framework). Under the Green Up and Green Up Plus loan offerings, borrowers commit to reducing their energy or water consumption by a minimum required savings threshold and, in return, receive the financing incentives, in the form of fee reimbursements for Green Assessments and better loan pricing. These loans serve as collateral for KG Certificates – the Freddie Mac environmental and social impact K-Deal series – and may be included in other K-Deals and other similar transactions.

From 2016 to 2018, over 450,000 units across over 1,600 properties were financed with Green Up and Green Up Plus loans totaling over \$44.7 billion.

Performance under the Green Up and Green Up Plus loan offerings is assessed annually, and savings threshold requirements have been progressively tightened to increase energy and water savings. Initially, the savings threshold was set at 15% of partial or whole property consumption to match Federal Housing Finance Agency (FHFA) requirements for uncapped volume treatment. In 2018, the savings threshold requirement was increased



to 25% of the whole property consumption, again to match FHFA scorecard requirements for uncapping volume. The savings threshold set in this framework is 30%, with 15% of the savings required from energy savings.

The Green Advantage program was developed and is overseen by the Freddie Mac's Multifamily Green Committee, which consists of representatives from various Multifamily lines of business: production, underwriting, credit policy, asset management, capital markets and legal. Members of this committee have expertise in financing multifamily development and experience with energy and water efficiency retrofits, energy and water audits, industry standards and property benchmarking. The Committee meets bi-weekly to review strategy and provide oversight and input across the program.

Freddie Mac has recently begun requiring borrowers to report both water and energy data for the whole property – regardless of the investment – to build a more complete picture of utility consumption trends across its portfolio. Freddie Mac issued its first *Green Improvements in Workforce Housing* report in December 2018, which analyzed historic utility consumption data to understand key drivers for investment in energy or water efficiency, aggregate impacts and benefits of its green loan program, and put them in the context of climate resilience. The report also examines trends in borrower preferences between water or energy efficiency investments by cost, savings, and geographic locations and provides visual representations of asset locations and water stress. The analysis notes a clear correlation between regions with water scarcity and investments in water conservation projects.

In 2017, Freddie Mac published preliminary findings on the impact of hurricanes on Multifamily loans in its portfolios for Hurricanes Harvey (748 loans with \$10 billion in unpaid balances) and Irma (1,249 loans with \$18.3 billion in unpaid balances). The report classifies damage assessments into four categories: major, moderate, minor and none, and provides maps of properties by damage classification. Preliminary findings show that approximately two thirds of properties had damage in both storms (mostly minor), caused primarily by flooding in Hurricane Harvey and windstorms in Hurricane Irma. It found that 59% of properties had some form of flood insurance, 56% of properties had business interruption coverage related to flooding, and 83% of properties had verified named storm coverage.

Freddie Mac has not currently set sustainability targets, such as reduced emissions associated with operations or investments, although reporting language in the framework does mention the possibility of translating energy and water efficiency performance data into environmental impact data. Freddie Mac does not currently conduct scenario stress testing as per the 2018 Task Force on Climate-Related Financial Disclosure (TCFD) recommendations<sup>1</sup>. However, Freddie Mac's standard due diligence does require that borrowers have property damage and liability insurance coverage for the asset, which includes insurance for windstorms, floods, and earthquakes, depending on exposure. Windstorm insurance is required for properties located in a Tier 1 Windstorm Risk Area or state designated high-risk wind country. Flood insurance is required for any properties that are fully or partially located in a Special Flood Hazard Area Zone A or V, as defined by the Federal Emergency Management Agency. Loan servicers also consider factors such as property location, number of stories, and type of building.

### Use of proceeds:

The proceeds generated under Freddie Mac's green bond framework will be used to fund the Green Up and Green Up Plus loan offerings under the Multifamily Green Advantage suite of offerings. Examples of projects included in Green Up and Green Up Plus loans include: water efficiency shower heads, faucet aerators, low-flow toilets, LED lightbulbs for private or common areas, ENERGY STAR appliances, improved insulation and window sealant. Properties that already qualify as green, manufactured housing communities, loans under Freddie Mac's

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<sup>1</sup> <https://www.fsb-tcfid.org/>



Small Balance Loan program and loans originated under forward commitments are not eligible for program funding under the Green Up and Green Up Plus loan offerings.

Freddie Mac has confirmed that loans that originated in 2018 with lower savings reductions thresholds (25% for energy and water with no minimum for energy) are also eligible under the green bond framework, in addition to loans originating in 2019 and onwards with higher savings reduction thresholds (30%) and a requirement for energy efficiency (15%) as detailed in the table below.

	<b>Green Up</b>	<b>Green Up Plus</b>
Minimum Projected Consumption Reduction	30% of energy or water/sewer consumption for the whole property, with a minimum of 15% from energy, based on baseline established in the Green Assessment	30% of energy or water/sewer consumption for the whole property, with a minimum of 15% from energy, based on baseline established in the Green Assessment Plus
Underwriting Approach	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	
Escrow Requirements	Funds for energy/water efficiency work will be escrowed at 125% of cost and released as work is completed. Freddie Mac has clarified that while the default is to escrow funds, it is possible that in lieu of an escrow, a guarantee of completion may be provided.	

### **Selection:**

Borrowers under both Green Up and Green Up Plus loans originating in 2019 and thereafter must commit to 30% reduced energy or water/sewer consumption for the whole property, with a minimum of 15% reduced energy use, and must report water and energy efficiency performance data via a qualified third party benchmarking data consultant. Loans originating in 2018 are required to commit to 25% reduction in energy or water use, with no minimum requirement for energy or third-party benchmarking data consultant. The baseline used to measure these reductions is set by the Green Assessment and calculated using one year of the most recent building-specific performance data.

Eligible green mortgage loans need to have secured a Green Assessment or Green Assessment Plus, and satisfy the underwriting criteria described in the Green Advantage Term Sheet, made publicly available on Freddie Mac's website. The Green Assessment and Green Assessment Plus require detailed audits, using ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Level 1 and Level II audits respectively, and must be conducted by qualified Green Consultants<sup>2</sup>. The assessments provide detailed property analysis and recommended property improvements for water and energy efficiency. Borrowers must select improvements that

<sup>2</sup> General requirements created by Freddie Mac for a Green Consultant include experience completing energy and water audits, understanding of the 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.



meet the required savings thresholds. Borrowers will be reimbursed the cost of the Green Assessment as part of the incentive package upon Freddie Mac’s purchase of the loan.

Green Assessment	<p>An energy savings and cost analysis for a property based on the ASHRAE Level 1 standard plus additional specific and rigorous inspection and consumption data requirements.</p> <p>ASHRAE Level 1 property reviews consists of a “walk-through audit,” an initial review of the property’s utility bills, and a brief site survey of the building, its systems and modes of operations. It also proposes improvements to promote utility consumption efficiency.</p> <p>Freddie Mac’s additional data requirements are detailed in its servicer guide, a legal contract with Optigo lenders that outlines Freddie Mac’s requirements. All loans are required to have a consultant analyze not just energy but also water performance at the property. Properties are benchmarked in Portfolio Manager and consultants are required to provide an Energy Star Score, Water Score, Energy Use Intensity and Water Use Intensity. The assessment also provides detailed documentation of the condition and performance of existing systems for heating, cooling, lighting, plumbing, water heating, and other appliances.</p>
Green Assessment Plus	<p>A detailed energy savings and cost analysis for a property based on the ASHRAE Level 2 standard.</p> <p>ASHRAE Level 2 audits include detailed fuel use analysis by end use and utility rates, and the building is benchmarked to gauge overall performance. All key building representatives (owners, managers, operators and occupants) are interviewed to gain a thorough understanding of the operational characteristics of the building, explore potential problem areas, and clarify financial and non-financial goals of the assessment. The site assessment may include diagnostic testing (e.g. duct leakage, water flow and temperature measures, solar shading analysis, humidity testing). The result of the analysis is an energy model for the building that creates a cost-effective scope of work for building improvements.</p>

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 before the final disbursement from the escrowed funds are released. Optigo lenders escrow the funds at 125 percent and disburse the funds upon borrower’s evidence that specific work has been performed and the final disbursement after receiving evidence of project completion. As part of a property’s annual inspection, Optigo lenders also check the completed work to ensure compliance with the terms of the loan documents.

**Management of proceeds:**

Green bond proceeds issued under the green bond framework will be designated through Freddie Mac’s KG-Deal program, part of Freddie Mac’s K-series platform. Each KG-Deal will have its own disclosure documents that will include disclosure related to the mortgage loans and mortgaged properties in such KG-Deal.





### Reporting:

The Green Up and Green Up Plus loan offerings require borrowers to monitor and report on energy and water consumption of the whole property during the life of the loan. Green Consultants 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 property. Borrowers are required to provide Freddie Mac with the actual energy and water usage (Benchmarking Data) at the property through EPA's Portfolio Manager tool. This data along with the data from the Green Assessment or Green Assessment Plus is used for analysis and reporting; it includes the following:

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

Green bond proceeds will be reported monthly by the master servicer and trustee as part of the standard Investor Reporting Package, where specific research reports are made available to investors through the Bloomberg terminal.

Freddie Mac will report asset-level and portfolio-level performance for green CMBSs in a publicly available, annually updated report as well as in the Multifamily Securities Investor Access Tool or its Security Lookup tool; both tools provide additional information for securitization deals and are publicly available on Freddie Mac's website.

The annual report will provide a breakout of green bond investments and allocations to each investment category and will highlight the programmatic activities and impacts tied to Green Advantage financing. Freddie Mac will explore potential impacts of loans in drought areas, energy constrained areas, and GHG emissions reduction / avoidance. The reports are intended to be consistent with the core principles and recommendations in the World Bank's "Green Bonds - Working Towards a Harmonized Framework for Impact Reporting (December 2015)".

As of 2019, all borrowers must engage a qualified third party to collect and report on Benchmarking Data as a condition for a Green Up or Green Up Plus loan. Prior to 2019, borrowers could choose to enter the data on their own or engage a third party. As consumption data is collected over time, Freddie Mac has and will continue to engage 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.





### 3 Assessment of Freddie Mac’s green bond framework and environmental policies


The framework and procedures for Freddie Mac’s green bond investments are assessed and their strengths and weaknesses are discussed in this section. The strengths of an investment framework with respect to environmental impact are areas where it clearly supports low-carbon and resilience projects, whereas the weaknesses are typically areas that are unclear or too general. Pitfalls are also raised in this section to note areas where issuers should be aware of potential macro-level impacts of investment projects.

#### Overall shading

Based on the project category shadings detailed below, and consideration of environmental ambitions and governance structure reflected in Freddie Mac ’s green bond framework, we rate the framework **Light Green**.

#### Eligible projects under the Freddie Mac green bond framework

At the basic level, the selection of eligible project categories is the primary mechanism to ensure that projects deliver environmental benefits. Through selection of project categories with clear environmental benefits, green bonds aim to provide investors with certainty that their investments deliver environmental returns as well as financial returns. The Green Bonds Principles (GBP)<sup>3</sup> state that the “overall environmental profile” of a project should be assessed and that the selection process should be “well defined”.

Category	Eligible project types	Green shading and notes
Green Up and Green Up Plus (GBP category: energy efficiency and sustainable water management)	Investments in existing, qualified multifamily properties that deliver 30% energy or water / sewer consumption savings, with a minimum of 15% from energy. Common examples include: <ul style="list-style-type: none"> <li>LED lighting for interiors, exteriors, common areas and HVAC thermostats</li> <li>Water-saving shower heads, bathroom aerators, kitchen aerators, and low-flow toilets.</li> </ul> 	<p><b>Light Green</b></p> <p>✓ These measures are important for the climate and the environment, but deeper efforts are required to be on track with a low-carbon future. The 30% requirement is in line with global targets for a 2°C climate change, but only if the full measure is focused on energy and not a combination of energy and water.</p> <p><b>Energy notes</b></p> <p>✓ Efficiency of building envelopes need to improve by 30% by 2025 to keep pace with increased building size and energy demand – in addition to improvements in lighting and appliances and</p>

<sup>3</sup> [www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp/](http://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp/)



increased renewable heat sources<sup>4</sup>. The impact of this category on reduced GHG emissions has potential to keep pace with the sector target but is dependent on the extent the measures are energy efficiency-focused above the required 15%, as well as the property baseline.

- ✓ The full list of eligible measures may include some fossil fuel elements, e.g. efficiency improvements for existing boilers and hot water heaters. These represent important short-term emission reductions for existing infrastructure. However, they do not facilitate a transition to renewable fuel sources and could extend the useful life of fossil fuel-based equipment and associated GHG emissions.
- ✓ Efficiency improvements may lead to rebound effects. When the cost of an activity is reduced, it may create incentives to do more of the same activity.
- ✓ Consider the emissions factor for district heating and electricity when calculating emissions reductions impact.
- ✓ Freddie Mac has noted that investments in renewable energy technologies are eligible under Green Up and Green Up Plus.

#### **Water notes**

- ✓ Water efficiency measures contribute to a climate adaptation and resilience, depending on the location. Consider the geographic context and its implications for expected and unexpected drought and flood. In areas with high levels of water scarcity, initiatives that reduce loss of water along distribution pipes, reduce water use, and that increase access to potable water are a strength. In coastal areas or flood plains, consider planning initiatives for flooding and sea level rise. Freddie Mac is mapping trends in investments by location and drought in the U.S. and has identified a clear correlation between investment in water efficiency measures and regions with water scarcity.
- ✓ Water efficiency measures can reduce energy use and thereby reduce associated GHGs.

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Table 1. Eligible project categories

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<sup>4</sup>Tracking Clean Energy Progress, IEA 2017 (<https://www.iea.org/etp/tracking2017/>)



## Background

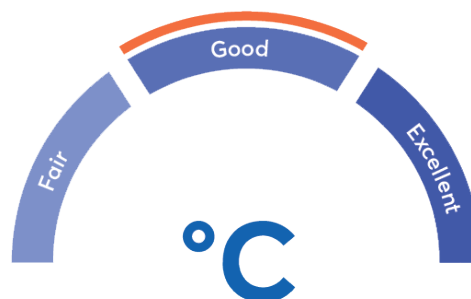
The buildings and building construction sectors combined are responsible for 36% of global final energy consumption and nearly 40% of total direct and indirect CO<sub>2</sub> emissions. Appliances (excluding heating, cooking and cooling appliances) are responsible for around 17% of final electricity use by buildings. The energy and emissions savings potential remains largely untapped because of continued use of less efficient technologies, lack of effective policies and weak investments in sustainable buildings. Efficiency of building envelopes needs to improve by 30% by 2025 to keep pace with increased building size and energy demand – in addition to improvements in lighting and appliances and increased renewable heat sources.<sup>5</sup> Energy efficiency improvements in buildings are thus important building blocks towards reaching the 2°C goal.

Physical climate change such as extreme events and flooding are affecting all sectors and regions already. Due to historical emissions, we are locked in for approximately 1.5°C global warming.<sup>6</sup> Given today's policy ambition, the world is most likely heading toward 3°C warming in 2100 which implies accelerated physical climate impacts, including more extreme storms, accelerated sea level rise, droughts and flooding.<sup>7</sup> For near-term physical risk, investors and companies must consider the probabilities of physical events and resiliency measures to plan for and protect against the worst impacts. Investments in water efficiency measures, particularly in regions vulnerable to drought or pervasive water scarcity, are therefore important climate resiliency measures.

## Governance Assessment

Four aspects are studied when assessing an issuer's governance procedures: 1) the policies and goals of relevance to the green bond framework; 2) the selection process used to identify eligible projects under the framework; 3) the management of proceeds; and 4) the reporting on the projects to investors. Based on these aspects, an overall grading is given on governance strength falling into one of three classes: Fair, Good or Excellent. This overall grade is combined with shades of green assigned to individual project categories to assess the final Shade of Green.

Freddie Mac's governance structure is sound, transparent and aligns with the GBP. The Green Assessment reports that determine project selection and subsequent impact data are subject to frequent auditing by external parties. There is a strong mechanism in place for removing projects that do not meet intended impacts. Funds for projects are typically held in escrow for up to two years and may be drawn down upon for specific items within the project, with final disbursements made upon completion of the project as verified by the servicer of the applicable loan. This approach allows Freddie Mac to reliably collect comprehensive, ongoing energy and water use and impact data from investment properties. On reporting, Freddie Mac will estimate environmental impacts where feasible and make the aggregate energy and water savings data, as well as Energy Star and Water scores, publicly available on Freddie Mac's website. Freddie Mac does not currently report against emissions reduction or climate resilience targets; however, it does require flood and windstorm insurance for vulnerable areas and has provided a progressive analysis of the correlation between investments in water savings equipment and drought-prone areas, as well as an analysis of flood and windstorm insurance covering the damage caused to properties by Hurricanes Harvey and Irma.



The overall assessment of the governance structure to support the implementation of the green bond framework gives it a rating of **Good**.

<sup>5</sup> <http://www.iea.org/tcep>

<sup>6</sup> <https://www.cicero.oslo.no/en/posts/news/scientists-demystify-climate-scenarios-for-investors>

<sup>7</sup> [https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR\\_AR5\\_FINAL\\_full\\_wcover.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full_wcover.pdf)



## Strengths

### Governance

Freddie Mac's Green Up and Green Up Plus loan offerings described in the green bond framework lays out a clear and transparent selection process for eligibility: eligible loans are subject to ASHRAE audits conducted by certified Green Consultants, and – as of 2019 – borrowers are required to engage a qualified third-party benchmarking consultant to report energy and water performance data. Loans originating in 2018, which also qualify for financing under this framework, did not have the third-party benchmarking consultant requirement. Funds for qualifying loans are not fully disbursed until completion of the project, as verified by the servicer of the applicable loan. Freddie Mac's approach to management of proceeds and risk management procedures help guarantee delivery of the projected impact and ensures performance-based rewards for investments in energy and water efficiency. This program is three years old and has collected progressively increased data and ambition for market adoption and portfolio performance.

Freddie Mac's Green Up and Green Up Plus loan offerings are also building breadth and depth of publicly accessible utility consumption data for the residential market across 42 states by requiring energy and water use data for the whole building on all loans. The resulting data is made publicly available on a several platforms, both on an ongoing basis and aggregated in annual reports. Freddie Mac has indicated that it is collecting and aggregating this data to address the current lack of energy and water efficiency data for the U.S. building sector; to strengthen and improve green practices in the broader multifamily market; and to provide broad insights into the types of improvements that can cost-competitively reduce both consumption and tenant expenses. CICERO Green commends the transparency and rigor of its data collection and reporting procedures, as well as Freddie Mac's initiative to align its impact report with the World Bank's "Green Bonds - Working Towards a Harmonized Framework for Impact Reporting (December 2015)." CICERO encourages Freddie Mac to continue building on its data collection and reporting by relating them to environmental impact indicators such as emissions reductions.

### Project Categories

Freddie Mac's Green Up and Green Up Plus loan offerings are successfully mobilizing investments in energy and water efficiency in the U.S. residential building sector at scale. As of the date of this review, water improvements across all loans are projected to save 3.6 billion gallons in water per year, and energy improvements are projected to save 1.4 billion kBtu per year. By typically holding funds for the Green Up and Green Up Plus loan offerings in escrow until project completion, Freddie Mac's program delivers on projected impact in a way few issuers have been able to do. It has also encouraged participation by reimbursing Green Assessment fees upon its purchase of the loan, which removes an early and low barrier to entry for many borrowers and increasing adoption faster than anticipated.

Freddie Mac's 30% savings threshold requirement, if used solely for energy efficiency investments, is in line with the global 2°C target. The minimum requirement of 15% savings in energy for all Green Up and Green Up Plus loans nudges investments towards energy efficiency. CICERO Green commends the effort to move the U.S. residential building sector towards improved energy efficiency and encourages Freddie to continue its practice of assessing performance, tightening requirements, and increasing ambitions annually.

Freddie Mac has published two reports that examine climate impacts (i.e., hurricanes and drought) on properties in its loan portfolio. Freddie Mac's October 2017 *Impact of Hurricanes on Multifamily Loans in Freddie Mac-Sponsored Securitizations* report published preliminary findings on the impact of hurricanes on Multifamily loans in its portfolios, assessed both level and source of damages as well as insurance coverage for affected properties. It also maps affected properties by damage classification. Along the same lines, the December 2018 *Green Improvements in Workforce Housing* report maps assets in its Green Up and Green Up Plus portfolio against drought zones. These analyses are in line with preliminary climate resilience planning and considered a forward-



thinking step not just for the building sector but for the green bond market. CICERO Green applauds this progressive analysis and encourages Freddie Mac to continue monitoring and reporting it. Understanding the link between investments in water efficiency and drought-prone regions could inform future selection criteria or loan terms. Similarly, there are potential future opportunities to align financial incentives for investments in energy efficiency or renewable energy in regions with carbon-intensive grids or high energy costs.

## Weaknesses

No significant weaknesses perceived at this time.

## Pitfalls

### *Governance*

Freddie Mac has indicated that it will explore potential impacts of loans in drought areas, energy constrained areas, and GHG emissions reduction / avoidance. However, at the time of this review, Freddie Mac has not measured or reported on greenhouse gas emissions nor set reduction targets for itself or its portfolio. CICERO Green encourages Freddie Mac to consider including emissions as a reporting metric in its reporting to investors and to set ambitious emissions reductions targets that are in line with the global 2°C degree target.

### *Project Categories*

Eligible project categories include investment in efficiency improvements for fossil fuel-based appliances and equipment. These investments represent important and much needed short-term emissions reduction for existing infrastructure in the U.S. residential building sector. However, these investments may extend the useful life of fossil fuel-based equipment and technology and delay transition to cleaner, lower carbon technology. The likely unintended effect is locking in additional greenhouse gas emissions in the near to mid-term. Additionally, efficiency improvements may lead to rebound effects which also represents potential increased emissions. When the cost of an activity is reduced, it may create incentives to do more of the same activity.

The minimum 15% energy savings threshold for Freddie Mac Green Up and Green Up Plus loan offerings encourages increased investment in energy efficiency. CICERO Green applauds this targeted effort but necessarily notes that the 15% minimum falls considerably below what is needed to meet global emissions reductions targets in the building sector.

Finally, the building sector is particularly vulnerable to the physical impacts of climate change, such as rising sea levels, extreme storms and flooding. Stronger hurricanes in combination with sea level rise in coastal areas, in addition to increases in heavy precipitation and flooding in urban areas, have already been observed and are expected to increase in the U.S. by mid-century across the range of climate scenarios explored in the IPCC 4<sup>th</sup> Assessment Report.<sup>8,9</sup> Meanwhile, increased water stress is expected in the southern region of the U.S. These physical impacts of climate change can cause property damage, discount property value, increase operational costs, and increase insurance premiums or change insurance coverage for coastal and urban communities in North America. Freddie Mac has conducted preliminary analysis on the impact of two hurricanes on properties in its portfolio and has mapped investments in water efficiency against drought-prone areas but does not have a structured approach for climate resilience planning. CICERO Green encourages Freddie Mac to assess and anticipate these risks to better identify and protect its customers, assets, and investors.

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<sup>8</sup> Shades of Climate Risk, CICERO 2017 (<https://cicero.oslo.no/en/climateriskreport>)

<sup>9</sup> Flood Risk for Investors, CICERO 2018 (<https://www.cicero.oslo.no/en/posts/news/half-of-flooding-damage-left-uninsured>)



# Appendix 1: Referenced Documents List

<b>Document Number</b>	<b>Document Name</b>	<b>Description</b>
0	Freddie Mac Green Bond Framework dated June 2019	Freddie Mac's green bond framework
1	K-Deal Program Term Sheet	Outlines transaction specific terms and parties used in Freddie Mac routine business related to its K-series platform.
2	Green Advantage Term Sheet	Overview of products offered through Green Advantage program and criteria for eligibility,
3	Green Improvements in Workforce Housing	Review and analysis of Freddie Mac Multifamily Green Advantage loan data detailing costs, pay back periods, reductions in energy and water
4	Sample Green Assessment	Green Up Level 1 Energy Assessment for a DC property, developed by Partner Energy
5	65 – Green Report Requirements	Chapter in the Multifamily Seller / Servicer guide that reviews the requirements, duties and responsibilities of the Optigo lender and the Green Consultant
6	Freddie Mac Multifamily Seller / Servicer Guide Chapter 31 – Insurance Requirements	Insurance requirements for eligible Multifamily loans and insurance terms
7	Freddie Mac Insurance Credit Policy	
8	Flood zone determination	Department of Homeland Security Federal Emergency Management Agency (FEMA) Standard Flood Hazard Determination Form
9	Green Deal Committee	Describes objective and lists members of Green Committee



## Appendix 2: About CICERO Shades of Green

CICERO Shades of Green (CICERO Green) is a subsidiary of the climate research institute CICERO. CICERO is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen international cooperation. CICERO has garnered attention for its work on the effects of manmade emissions on the climate and has played an active role in the UN's IPCC since 1995. CICERO staff provide quality control and methodological development for CICERO Green.

CICERO Green provides second opinions on institutions' frameworks and guidance for assessing and selecting eligible projects for green bond investments. CICERO Green is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO Green is independent of the entity issuing the bond, its directors, senior management and advisers, and is remunerated in a way that prevents any conflicts of interests arising as a result of the fee structure. CICERO Green operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

We work with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions (ENSO). Led by CICERO Green, ENSO contributes expertise to the second opinions, and is comprised of a network of trusted, independent research institutions and reputable experts on climate change and other environmental issues, including the Basque Center for Climate Change (BC3), the Stockholm Environment Institute, the Institute of Energy, Environment and Economy at Tsinghua University and the International Institute for Sustainable Development (IISD).

