CICERO
Center for International
Climate Research

‘Second Opinion’ on Fannie Mae Multifamily Green Bond Framework

June 8, 2018

Summary

Fannie Mae Multifamily Green Bond Framework provides a structured, sound and innovative approach to green financing for energy and water efficiency investments in the multifamily rental property market in the United States. The processes and categories outlined in this framework demonstrate comprehensive, sophisticated analysis of green building certifications and provide lenders and property owners with financial incentives to invest in water and energy efficiency measures. The Framework is aligned with the recommendations laid out in the Green Bond Principles and uses established green building certifications (GBCs) and energy and water efficiency measures to inform its selection criteria for Green Mortgage Backed Securities (MBS).

Fannie Mae is a pioneer in valuing and increasing awareness of green buildings. The issuer's Green MBS business supports investments in energy or water efficiency measures or renewable energy generation in existing multifamily rental properties, with the overarching objective of improving the quality of buildings in the US rental market. The three products in the Green MBS business offer opportunities to reward environmentally friendly investments with preferential interest rates for loans. Fannie Mae conducts on-going, in-depth analysis of the GBCs available in the market and has organized them into three levels according to energy, water and environmental impacts. Fannie Mae's Delegated Underwriting and Servicing (DUS) Lenders review their exposure to flood risk via required reports for each property, which is an effective first assessment of physical climate change risk.

The Framework does allow for some elements of fossil fuel in efficiency measures, e.g. in existing boilers. 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. Fannie Mae does not currently have explicit greenhouse gas reduction targets at the organizational level or for its Green MBS products.

The issuer has rigorous governance mechanisms in place to ensure transparency and accountability. The processes and implementing parties are frequently audited, and staff responsible for screening investments receive regular training on energy and water efficiency and energy generation. Fannie Mae offers annual energy and water use performance data for properties in its MBS business on an annual basis.

Based on the overall assessment of the activities that will be financed and the governance of the framework, Fannie Mae Multifamily Green Bond Framework receives a Light Green shading. Investments in all shades of green projects are necessary in order to successfully implement the ambition of the Paris agreement. Light Green represents solutions that are a necessary and important first step in a low-carbon and climate resilient transition, by reducing the climate and environmental impact of existing infrastructure and equipment. Eligible products under the Framework include a range from light to medium green efficiency improvements, but also include some fossil fuel elements. The governance of the Framework includes rigorous auditing and reporting, and consideration of water efficiency and flooding risk exposure, but does not explicitly manage GHG emission reductions.

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Light Green

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1 Introduction and background

As an independent, not-for-profit, research institute, CICERO Center for International Climate Research provides independent Second Opinions on institutions' green bond frameworks which includes a focused overview of selection and evaluation criteria for eligible projects as well as an assessment of the framework's alignment with the institutions' environmental objectives and a low-carbon, climate resilient economy. The Second Opinion is based on documentation of rules and frameworks provided by the institutions themselves (the client) and information gathered during meetings, teleconferences, and e-mail correspondence with the client.

CICERO has established the global Expert Network on Second Opinions (ENSO), a network of independent non-profit research institutions on climate change and other environmental issues, to expand the technical and geographic breadth and depth for Second Opinions reviews. CICERO works confidentially with other members in the network to enhance the links to climate and environmental science, building upon the CICERO model for Second Opinions. In addition to CICERO, ENSO members currently include Basque Center for Climate Change (BC3), International Institute for Sustainable Development (IISD), Stockholm Environment Institute (SEI), and Tsinghua University's Institute of Energy, Environment and Economy. A more detailed description of CICERO can be found at the end of this report. ENSO 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.

CICERO's Second Opinions are normally restricted to an evaluation of the mechanisms or framework for selecting eligible projects at a general level. ENSO network members do not validate or certify the climate effects of single projects, and thus, have no conflict of interest with regard to single projects. Network members are neither responsible for how the framework or mechanisms are implemented and followed up by the institutions, nor the outcome of investments in eligible projects. CICERO 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.

This note provides a Second Opinion of Fannie Mae Multifamily Green Bond Framework and policies for considering the environmental impacts of their projects. The aim is to assess the Fannie Mae Multifamily Green Bond Framework as to its ability to support their stated objective of greener rental housing in the United States.

This Second Opinion is based on the green bond framework presented to CICERO by the issuer. Any amendments or updates to the framework require that CICERO undertake a new assessment.

CICERO takes a long-term view on activities that support a low-carbon, climate resilient society. In some cases, activities or technologies that reduce near-term emissions result in net emissions or prolonged use of high-emitting infrastructure in the long run. CICERO strives to avoid locking-in long-term emissions with short-term solutions, and encourages careful infrastructure investments that will move economies towards low- or zero-emitting, climate resilient infrastructure and activities in the long run. Proceeds from green bonds may be used for financing, including refinancing, new or existing green projects as defined under the mechanisms or framework. In this Second Opinion, CICERO assesses the alignment of issuer's proposed project categories with a smooth transition to a low-carbon and climate resilient future.

Expressing risk and impact with 'shades of green'

CICERO Second Opinions award a dark green, medium green or light green shading, reflecting both the climate and environmental ambitions and the governance structure of the green bond framework, as well as the resulting investments' short and long-term exposure to carbon risk. The shading is based on a broad qualitative assessment of each project type, in addition to the governance structures that support implementation of the framework, according to what extent it contributes to a low-carbon and climate resilient society. The shading is also intended to translate climate science into investment risk for investors: a dark green project is less exposed to climate risks than a lighter green investment. Investments in all shades of green projects are necessary in order to successfully implement the ambition of the Paris agreement.

The 'shades of green' indicate the following:

- **Dark green** for projects and solutions that are present-day realizations of the long-term vision of a low carbon and climate resilient future. Typically, this will entail net-zero or net-negative emissions investments and governance structures that transparently integrate environmental concerns into project design and implementation.
- **Medium green** for projects and solutions that represent steps towards the long-term vision by reducing emissions in the short- to medium- term and actively facilitating the transition to a low carbon, climate resilient.
- **Light green** for quick fix projects and solutions that reduce the environmental impact of existing technologies and begin the transition to the long-term vision, but are not expected to be part of medium or long-term solutions (e.g. energy efficiency in fossil-based processes).
- **Brown** for projects that do not improve or enhance the detrimental environmental effects of an activity or technology, in opposition of the long-term vision of a low carbon and climate resilient future.

The overall rating is defined primarily by the project types that will be financed by the green bond, with additional consideration of the issuer's governance and transparency measures. The latter demonstrates the issuing institutions systems and capacity to identify, deliver, and report on the framework objectives. The overall shading reflects an ambition of having the majority of the project types well represented in the future portfolio, unless otherwise expressed by the issuer.

2 Brief Description of Fannie Mae Multifamily Green Bond Framework and rules and procedures for climate-related activities

The Federal National Mortgage Association (Fannie Mae) is the largest U.S. government-sponsored enterprise (GSE), chartered in 1938 by the United States Congress. Fannie Mae's mission is to support liquidity and stability in the secondary U.S. residential mortgage market, and to help underserved markets, such as affordable housing for low- and moderate-income families. It provides market liquidity by purchasing qualifying mortgages from lenders, which it bundles into securitized bonds – or Mortgage Backed Securities (MBS) – and sells to investors with guarantees; it does not lend directly to consumers.

Fannie Mae serves the housing market through the Single Family and the Multifamily Mortgage Businesses. The Fannie Mae Multifamily Mortgage Business has a Delegated Underwriting and Services Program (DUS®) that uses a national network of DUS lenders to finance apartment buildings with rental units, manufactured housing campuses and cooperatives. According to the issuer, Fannie Mae Multifamily only provides mortgage loans for owners to refinance multifamily properties that are already built or to acquire multifamily properties that are already built, and supplemental loans for existing mortgage holders. Fannie Mae does not provide mortgage loans to developers to construct new properties.

Fannie Mae has had its Green Financing Advisory Council in place since 2010, originally called the Green Rental Housing Task Force. The Council meets at least once a year in-person to discuss market transformation goals and the strategy of the Green Financing Business. The Council is governed by a Charter, and its invited members represent key stakeholders in the multifamily and sustainability industries including US Federal Agencies, Green Building Certification-issuing organizations, non-profits engaged in energy efficiency policy, multifamily lenders and property owners.

The Fannie Mae Multifamily Mortgage Business launched its Multifamily Green Financing Business in 2010, which includes three Green Mortgage Loan Products for existing residential rental properties in the United States. Through this Business, Fannie Mae seeks to create more affordable quality housing in the United States, reduce the real estate sector's impact on the environment, and create financial value by offering financing solutions for energy and water efficiency investments, green building certification, and renewable energy to apartment buildings and cooperatives. It launched its first Green Mortgage Loan product in 2011, and issued its first Green MBS in 2012. In 2017, it issued $27.6 billion in Green MBS and securitized an additional $3.4 billion in Green GeMS (Guaranteed Multifamily Structures) REMICs (Real Estate Mortgage Investment Conduit), making it the largest issuer of green bonds globally.

Fannie Mae's Green Financing Business has been recognized by the following organizations:

- US Environmental Protection Agency's (EPA) ENERGY STAR's Partner of the Year Award in (2015, 2016, 2017, 2018); and, Sustained Excellence Award (2017 and 2018)
- Climate Bonds Initiative's Green Bonds Pioneer Award for the Largest Overall Issuer to a Trillion Market (2018)
- Environmental Finance for 2018 Green Bond Awards' Biggest Issuer (2018)

- GlobalCapital's Securitization Award for CMBS Deal of the Year for Fannie Mae GeMS™ green bond, FNA 2017-M10 (2018)

Use of proceeds:

According to the issuer, proceeds from each Fannie Mae Multifamily Green MBS are used to finance individual Green Mortgage Loans, which have originated and closed prior to the bond being issued. A Green MBS is a Green Bond, where the bond is secured by an existing piece of real estate collateral. Fannie Mae's Multifamily Green Financing Business offers three Green Mortgage Loan products through its 30-year old DUS Multifamily business to source potential green financing opportunities. The loan products include refinancing or acquisition for existing properties which have been awarded a green building certification and for renovations, retrofits, and repairs that reduce energy or water consumption by 25% or more from baseline performance on existing properties, as specified below. The baseline for each property is the buildings' prior actual 12-month energy or water use, and is calculated using all energy and water inputs and outputs, including natural gas, fuel oil, electricity, and energy generation from renewable energy.

Eligible green mortgage products fall into three categories: Green Building Certification, Green Rewards, and Green Preservation Plus. Building certifications that are recognized by Fannie Mae are described below.

To be eligible for a Green Building Certification (GBC) loan, the owner's property must have been awarded one of 15 certifications recognized by Fannie Mae, which have been evaluated, ranked, and sorted into three levels by an independent consulting firm. According to the issuer and based on 3rd party assessment, Level 1 certificates are considered the greenest and have a measurable reduction of 15% or more on energy or water over the property's baseline or a national standard as a requirement to get certified. The only GBC program that incorporates measurement against national standards is ENERGY STAR. Specific scores within a certification program are not considered; the lowest possible score for a certification determines whether the certification is a Level 1, 2, or 3. Fannie Mae evaluates this list annually to determine if a certification should be removed due to failure to meet the criteria, or if a new certification should be added due to meeting the criteria.

Green Level	Green Level Definition	Green Building Certification
Level 1	• Reduces water or energy consumption by 15% or more over the property's baseline or a national standard as required by the certification	○ ENERGY STAR Existing Multifamily Building ○ ENERGY STAR Qualified Multifamily High Rise – Performance ○ Enterprise Green Communities Criteria ○ LEED v4 Operations and Maintenance ○ NGBS Green Multifamily Building Certification ○ NGBS Green Home Remodeling Project ○ EarthCraft ○ GreenPoint Rated New Home Multifamily
Level 2	• Has prerequisites tied to reducing water or energy consumption at an unspecified percentage that must be satisfied to receive the certification	○ ENERGY STAR Qualified Multifamily High Rise – Prescriptive ○ ENERGY STAR Certified Homes ○ LEED v4 Homes ○ LEED v4 Building Design and Construction ○ GreenPoint Rated Existing Multifamily Whole Building
Level 3	• Targets improvements in several environmental areas to receive certification, but reductions in water or energy use are not required.	○ Green Globes New Construction ○ Green Globes Existing Building

Table 1 Eligible certifications

Selection

Loans are considered eligible if they conforms to the DUS Guide, forms and loan agreements that govern Green Mortgage Loan eligibility at the time of the delivery. Green Mortgage loans are closed before the MBS is issued.

The DUS Guide and the Green Chapter contained within, forms and loan agreements that govern Green Mortgage Loan eligibility, and the process for evaluation and selection of Green Mortgage Loans include a series of steps for Green Building Certification loans. The borrower must provide the DUS lender with a copy of the property's certification from one of the 15 the issuing organizations recognized by Fannie Mae. The Lender must provide the certification to Fannie Mae at the time of loan delivery. DUS lenders identify, screen and select properties and originate the Green Mortgage Loans that are eligible for Green MBS; these lenders go through extensive training on energy and water efficiency and energy generation to ensure a baseline understanding of environmental implications of real estate properties. Lenders have in-house Subject Matter Experts (SMEs) that are required to attend Fannie Mae's regular training sessions and meetings every two weeks to learn and discuss technical matters related to energy, water and environmental issues. The resulting loans are reviewed and approved by Chief Underwriters.

Securing the Green MBS designation on a Green Rewards or Green Preservation Plus loan requires a series of steps requiring the DUS lender to complete flood risk report, per DUS requirements, and a High-Performance Building Report that meets ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Level II and Fannie Mae standards, using a qualified independent High Performance Building (HPB) consultant. The report informs the borrower of all the opportunities at the property to save energy and water, and the list from which the borrower must select improvements that project to save at least 25% on energy consumption or water consumption to qualify.

For all three project categories, at the time of closing the loan, the borrower must sign loan document Form 6241 committing to report to Fannie Mae annually the property's energy and water performance including the ENERGY STAR Score and Source Energy Use Intensity (EUI). The lender must submit the HPB Report to Fannie Mae at the time of loan delivery, which occurs after locking the rate and closing the loan with the borrower.

Failure to meet any of the described conditions will result in the inability of the MBS to obtain a "green" label, and of the borrower to access the financial incentives available to loans in the Green Financing Business.

Fannie Mae's Green Financing Business strategy, loan products and portfolio is led by a Director and consists of a dedicated team of finance and sustainability experts. The Director's and team members' deep expertise includes solar financing, energy and water efficiency technologies, energy audit standards, energy benchmarking protocols to green building certifications. The Director reports on the performance of the Green Financing Business to the executive leadership of the Multifamily Business.

Management of proceeds

For generation of proceeds, the DUS lender auctions the Green MBS to the general MBS investor community approximately 30 days before settlement. The proceeds from the MBS go solely to support the property backing the Green Mortgage Loan.

Fannie Mae uses an escrow account to track and manage loan proceeds; these accounts are overseen by Fannie Mae's lender partners. When a Green Rewards loan closes, the anticipated costs of making the necessary energy or water improvements to the property are put into an escrow account and documented in the Completion Repair Agreement. The Green Finance Business requires that borrowers implement their energy and water improvements no later than 12 months from loan closing. The lender releases the funds from escrow back to the multifamily owner/borrower only when the owner provides documentation, such as invoices, confirming that the improvements have been purchased. The Lender conducts a site visit of the property to evaluate its condition on a periodic basis. Fannie Mae requires confirmation from the lenders that the green improvements were made to the borrower's property by the deadline.

The network of Fannie Mae's lender partners that oversee the escrow accounts for the Green Rewards borrowers hold a license to conduct Fannie Mae business and are risk-sharing partners in the loans originated. This relationship ensures the responsible management of the energy and water improvements-related proceeds in the green escrow accounts.

Transparency and Accountability

Reporting

As part of its commitment to transparency and reporting, Fannie Mae maintains a Green Financing website where investors can find background material on the Green Financing Business (www.fanniemaegreenfinancing.com). Fannie Mae intends to publish the Green Bond Framework publicly on this website. In addition, Fannie Mae maintains a file listing all of the MBS and GeMS products backed by Fannie Mae Green Financing products by Pool Number and CUSIP Identifier (https://www.fanniemae.com/multifamily/green-initiative-green-mbs); this file is updated on a monthly basis. For more extensive disclosure, investors can look up any DUS or GeMS tranche CUSIP Identifier in Fannie Mae's public disclosure system, DUS Disclose (https://mfdusdisclose.fanniemae.com/#/home) where at-issuance and on-going data is available for all of its DUS MBS. This system includes the energy and water performance data reported by all borrowers using Green Financing products. Currently on DUS Disclose, each property behind a Green MBS reports its at-issuance ENERGY STAR Score and Source Energy Use Intensity (EUI) along with the date of that data. GHG emission

reductions can also calculated using the historical and projected energy and water consumption data from the High Performance Building Report.

An investor report will be made available on the investor relations pages of the FNMA website on an annual basis. The details of this report will include 1) a list of the different categories of eligible assets financed and the percentage distribution to each such category, 2) a description of a selection of eligible assets, as examples of the projects financed in that year and 3) a summary of FNMA's green bond development and green financing activities in general including energy versus water investments. A breakdown of investments can be viewed here: https://www.fanniemae.com/multifamily/green-initiative-green-mbs. Fannie Mae does not report on the breakdown of Green MBS by GBC level.

Fannie Mae is in the process of developing means to report ongoing energy and water performance data to investors (until the technology development work is complete, the firm may publish the data on its website in a report format). Fannie Mae is also in the process of adding the US EPA water score (a score indicating relative water consumption for multifamily properties) to the list of required reporting from borrowers in the Green Financing business.

In addition, Fannie Mae requires borrowers to submit energy performance metrics (EPMs) to US EPA each year for the life of the loan if the property either has a Green Mortgage Loan or is covered by a mandatory local annual energy benchmarking ordinance. Borrowers enter utility, water, and property data into the US EPA's ENERGY STAR Portfolio Manager, a free online system, and submit the EPMs to Servicers along with Annual Operating Statements.

Auditing

Multiple, in-depth, internal audits are conducted on a sampling of Green Mortgage Loan products. The Fannie Mae Multifamily Loan Surveillance and the Green Financing teams jointly conduct audits on Lender's and HPB consultants' activities, as well as on HPB reports and energy and water data reported annually to Fannie Mae.

- For Lender audits, for the first three months after a Lender has been delegated approval of green loans, 20% of each Lender's delivered Green Mortgage loans will be reviewed each month. Starting in month four, 10% of each Lender's Green Mortgage loans will be reviewed each month. If a loan is found to have significant issues that impact its eligibility for green pricing and disclosure as a Green MBS, remedies may include requiring repurchase of the loan by the Lender. In the case of a lack of certification results in a loss of eligibility and the loan is made available for repurchase.
- For HPB consultants: for the first three months after a Consultant is pre-qualified, a minimum of three reports by each consultant that were approved by Lenders will be reviewed each month. Starting in month four, a minimum of two reports by each approved consultant will be reviewed. If multiple HPB Reports are found to have significant issues, remedies may include loss of a pre-qualified HPB Consultant's status as pre-qualified, or exclusion from pool of eligible consultants.

The table below lists the documents that formed the basis for this Second Opinion:

Document Number	Document Name	Description
1	Fannie Mae Multifamily Green Bond Framework (draft 4 June 2018)	Fannie Mae's green bond framework with detailed descriptions of products and governance products for quality control, monitoring, reporting, and verification.
2	Fannie Mae Code of Conduct	Policy manual and guidance for staff conduct and business ethics
3	Fannie Mae 10k_2017	Public financial disclosure form with detailed information about performance and structure
4	Fannie Mae Multifamily and Green Financing slides_April 2018	Presentation with a focus on Fannie Mae's Green Financing Business, products, and performance
5	Updated 4099h_Apple Apartments example	Example of high performing building report
6	Apple Apts HPB report_final_3-28-17	Example of high performing building report
7	Fannie Mae: America's Housing Partner – 2017 Progress Report	Report reviewing organizational targets and performance in market share, portfolio make up, product development, and initiatives such as green financing and the Sustainable Communities Challenge.
8	Fannie Mae Eligible EWEMs June 2018	List of allowable energy and water efficiency measures
9	Fannie Mae GBC Evaluation Flow Chart Methodology – June 2018	Flow chart of determination of levels for recognized certifications
10	Fannie Mae Multifamily Green MBS Issuances	List of Green MBS issuances by type and year

Table 2 Documents reviewed

3 Assessment of Fannie Mae Multifamily Green Bond framework and environmental policies

The framework and procedures for Fannie Mae'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 the issuer's systematic sustainability work and governance structure of Fannie Mae's green bond framework in terms of management and use of proceeds, we rate the framework CICERO Light Green.

Eligible projects under the 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 certainty to investors that their investments deliver environmental returns as well as financial returns. The Green Bonds Principles (GBP) 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 some concerns
Green building	**Green building certifications** Properties that have one of the 15 recognized green building certifications (see Table 1)	**Light Green** ✓ Voluntary environmental certifications such as LEED and EarthCraft or equivalents provide varying levels of measurement of environmental footprints for a building. However, they do not guarantee a reduction in GHG emissions. The lowest level of certifications eligible do not require energy or water reduction targets. ✓ There is currently no distinction between certification scores achieved (e.g. LEED silver versus gold). There can be a wide range of requirements for energy efficiency and other aspects depending on the level of certification. ✓ In a low-carbon 2050 perspective, the energy performance of buildings is expected to be improved, with passive and energy-contributing housing

		technologies becoming more mainstream and the energy performance of existing buildings greatly improved through refurbishments. According to the issuer, passive house certifications will be included in the next iteration of certification levels.
	Green Rewards	**Light to Medium Green**
	Energy and water efficiency measures (EWEMs) that are projected to save 25% or more on energy consumption or 25% or more on water consumption, or to generate and save 25% or more of baseline energy through a combination of renewable energy generation and energy consumption reduction.[1] Eligible EWEMs include: • Solar systems • Energy efficiency heating, ventilation, and air conditioning (HVAC) systems • Energy efficient boilers • Energy efficient lighting, such as LED • Smart technologies, such as programmable thermostats in each residential unit and Building Management (BMS) systems for central building control • Water efficient fixtures including low-flow toilets and faucets • Energy efficient appliances such as ENERGY STAR® refrigerators • Energy saving improvements such as adding insulation, low U-factor and low solar heat gain coefficient (SHGC) windows, light reflective roofing, roof gardens	✓ These measures are important for the climate and the environment, but deeper efforts are required to be on track with a low-carbon future. 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 increased renewable heat sources[2]. The impact of this category on reduced GHG emissions is dependent on the extent the measures are energy efficiency focused, and the property baseline (consumption over the previous 12 months). Water efficiency measures can contribute to a climate adaptation depending on the location. ✓ The full list of eligible EWEM measures includes some fossil fuel elements, e.g. efficiency improvements in existing boilers and hot water heaters, as well as replacements. These represent important short-term emission reductions, but do not ultimately transition to alternative fuel sources, and could have associated lock-in and rebound effects.
	Green Preservation Plus	**Light Green**
	Same criteria as above, applied to Affordable Housing, but without the percentage savings requirements. The EWEMs capital cost must be equivalent to 5% of the loan proceeds.	✓ These measures are important for the climate and the environment, but do not target a specific improvement level. The impact of this category on reduced GHG emissions is dependent on the extent the measures are energy efficiency focused, and the

[1] Loans originated before December 18, 2017 are eligible if the owner selected EWEMs that projected to save 20% or more on energy consumption, 20% on water consumption, or a 20% energy generation and energy reduction combination.

[2]Tracking Clean Energy Progress, IEA 2017 (https://www.iea.org/etp/tracking2017/)

	property baseline (consumption over the previous 12 months). Water efficiency measures can contribute to a climate adaptation depending on the location. ✓ The full list of eligible EWEM measures includes some fossil fuel elements, e.g. efficiency improvements in existing boilers and hot water heaters, as well as replacements. These represent important short-term emission reductions, but do not ultimately transition to alternative fuel sources, and could have associated lock-in and rebound effects.

Table 3 Eligible product categories

For all loans financed, regular property maintenance is required for the mortgage, including repairs related to life-and-safety such as parking lot repairs, which could have some unavoidable but limited exposure to fossil fuels. Across the green bond portfolio, the majority of products is expected to be in the Green Rewards category, following the MBS portfolio trend in recent years.

Strengths

By introducing the first pricing break for green building certifications or performance in the U.S. multifamily rental property market, Fannie Mae has encouraged and raised awareness of green buildings and water and energy efficiency improvement initiatives. The program is now 8 years old and Fannie Mae continues to assess and refine strategies to improve market-wide adoption of efficiency technologies and incrementally reduce environmental impact among the poorest efficiency performers. The result is expected to raise the floor on energy and water performance of properties in this market.

Fannie Mae also reviews exposure to flood risk, which is an effective first assessment of physical climate change risk. Fannie Mae's DUS Lenders are required to review properties' exposure to flood risk, which is based on the latest available flood zone maps according to the issuer. 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 US by mid-century across the range of climate scenarios explored in the IPCC 4th Assessment Report.[3,4] Meanwhile, increased water stress is expected in the southern region of the US. 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. We encourage Fannie Mae to continue to assess and further anticipate these climate risks by also considering the potential impact of heat stress on energy use.

Fannie Mae has well-established governance and risk management procedures that ensure frequent and comprehensive audits of consultants, reports, and property performance data. Audits are results-based and include site visits for verification. If buildings or consultants fail to meet the criteria, there is a mechanism to remove them from eligibility. Fannie Mae does not currently issue a sustainability report or have organizational or program-level targets for GHG reductions, however the issuer has indicated that it will issue a sustainability report including projected GHG emissions to be reduced by its lending portfolio. Fannie Mae relies on external, established green

[3] Shades of Climate Risk, CICERO 2017 (https://cicero.oslo.no/en/climateriskreport)
[4] Flood Risk for Investors, CICERO 2018 (https://www.cicero.oslo.no/en/posts/news/half-of-flooding-damage-left-uninsured)

building certifications with comprehensive auditing procedures, providing confidence in the issuer's ability to achieve the green ambitions of the framework.

The list of eligible Green Building Certifications undergoes robust analysis in addition to internal annual review and revision by the Green Financing Business team, which can include adding or removing certifications from eligibility. The issuer engages a third party industry expert in energy and water engineering to review the green building certifications available on the market on an annual basis; the certifications are evaluated by requirements and implied environmental impact for each available score. This comprehensive analysis of energy, water, and other environmental criteria involves assessment of over 60 potential scores across 19 certifications. This year's assessment includes Passive House, which is one of the most advanced building standards available. In an effort to recognize the certifications that will have greater environmental impact, the certifications were sorted into three levels last year. These levels of environmental impact are tied to potential preferential interest rates. According to the issuer, Fannie Mae will offer organizations issuing the GBCs an opportunity to sign an agreement that will cement a partnership between the GBC organization, and the issuer and will ensure progressively more rigorous standards for their respective certifications. Because of Fannie Mae's considerable presence in the market, this applied pressure and commitment to collaborate can have a significant impact on future standards and performance.

The issuer has integrated transparent reporting procedures, with platforms that are updated annually and detailed information that is publicly available. The issuer requires energy or water use data from all financed properties, which supports highly transparent and performance-based data availability. Reported data is available for each loan. Aggregated information on total efficiency improvements and GHG emissions for MBS products would further improve the usefulness of data for impact reporting.

To inform eligibility screening, the issuer invests in in-house technical expertise and tools. Fannie Mae's broad network of DUS Lenders go through continual training on energy and water efficiency, and energy generation which ensures a strong baseline of technical expertise in environmental impact of real estate properties for staff reviewing initial green loan applications. DUS Lenders' Subject Matter Experts (SMEs) are required to attend training sessions and meetings every two weeks.

Weaknesses

No significant weaknesses perceived.

Pitfalls

Eligible product categories may allow for some amount of efficiency improvements in fossil-fuel based appliances and equipment. For Green Rewards and Green Preservation Plus, eligible EWEM measures includes e.g. efficiency improvements in existing boilers and hot water heaters, as well as replacements. These represent important short-term emission reductions, but do not ultimately transition to alternative fuel sources, and could have associated rebound effects. Across all loan products, regular property maintenance is required for the mortgage, including repairs related to life-and-safety such as parking lot repairs, which could have some unavoidable but limited exposure to fossil fuels. Overall, the Green Bond Framework targets efficiency improvements in existing multifamily rental properties, which have the possibility to be significant. The net GHG impact over time should be considered in relation to possible lock-in via extension of the lifetime of fossil fuel-based equipment and possible rebound effects that result in increased energy use.

Voluntary green building certifications do not guarantee reduced emissions or other environmental benefits. Fannie Mae analyzes the significant degree of variation in requirements from the certification programs, and excludes

some from eligibility, but does not distinguish between scores within a specific Green Building Certification program. This results in the lowest level of eligible certifications forming the basis for eligibility, some of which do not have energy or water efficiency requirements. Fannie Mae conducts extensive analysis in considering levels of eligible certifications, and considering higher certification levels for possible favorable pricing. However, the resulting emission reductions from the varying levels and scores within the certification programs can vary greatly. While the level of certification is the MBS buyers' choice in the market, the impact on the environment can range from negligible to significant. Further, GHG emission reductions of the buildings and the related transportation and supply chain emissions are not explicitly targeted or reported on by Fannie Mae. The issuer is encouraged to consider GHG emission consideration for transparency on, and management of, climate impact.

For Green Rewards and Green Preservation Plus, energy and water efficiency measures are assessed using a baseline of the past performance of the specific property (over the previous 12 months). The issuer is encouraged to consider GHG targets and comparisons with sector and regional averages to support explicit management of climate impacts.

Appendix
About CICERO

CICERO Center for International Climate Research is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen inter-national climate cooperation. We collaborate with top researchers from around the world and publish in recognized international journals, reports, books and periodicals. CICERO has garnered particular attention for its work on the effects of manmade emissions on the climate and the formulation of inter-national agreements and has played an active role in the UN's IPCC since 1995.

CICERO is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO received a Green Bond Award from Climate Bonds Initiative for being the biggest second opinion provider in 2016 and from Environmental Finance for being the best external review provider (2017).

CICERO Second Opinions are graded dark green, medium green and light green to offer investors better insight in the environmental quality of green bonds. The shading, introduced in spring 2015, reflects the climate and environmental ambitions of the bonds in the light of the transition to a low-car-bon society.

CICERO works with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions. Led by CICERO, ENSO is comprised of trusted 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). ENSO operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

cicero.oslo.no/greenbonds