

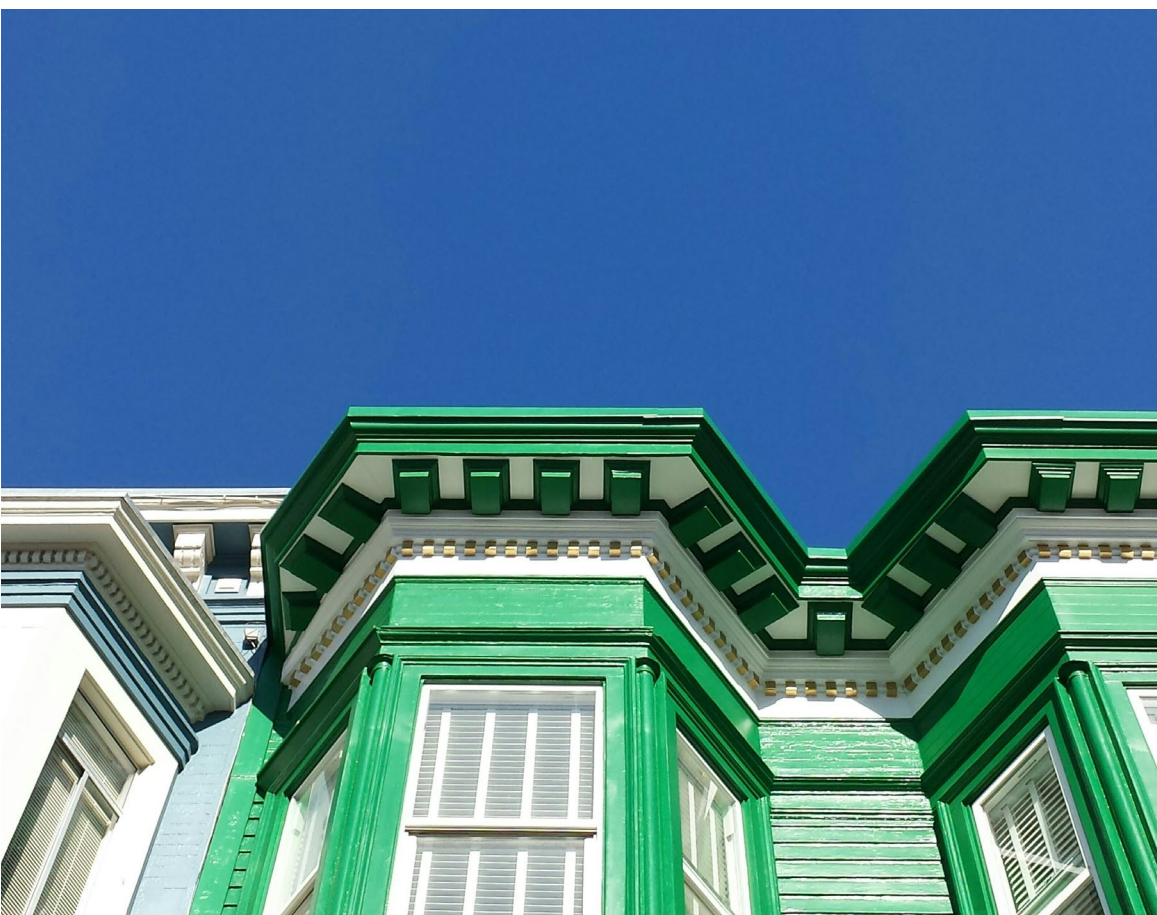
Building Energy Regulations And The Potential Impact On European RMBS

Sept. 6, 2023

Climate transition risks related to changes in building energy efficiency regulations are not currently a material driver of European RMBS' credit quality.

This research report does not comment on current or future credit ratings or credit rating methodologies. It is part of the Toward Net Zero report series and reflects research conducted by and contributions from S&P Global Ratings' structured finance and sustainability research teams.

This report does not constitute a rating action.



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Several countries in Europe have committed to cutting their greenhouse gas emissions by 2050, and energy efficiency of homes is a primary focus of policymakers. This research aims to explore the potential effects of the resulting initiatives in S&P Global Ratings' analysis of loan pools backing residential mortgage-backed securities (RMBS) in the region.

To do so, we conducted a scenario analysis of properties in the U.K. (focusing on England and Wales), Ireland, France, and the Netherlands, where energy performance certificates (EPCs) indicate low energy efficiency (for example classes F and G). Our scenario analysis assumes energy efficiency regulations would lower property values if owners do not carry out any renovations to improve energy efficiency. This research entailed a review of energy efficiency regulations for residential buildings and a comparison of EPC data reporting by country.

Key Takeaways

- **Climate transition risks linked to changes in energy-efficiency performance regulations currently have a limited impact on European RMBS.** This is due to uncertainties on the timing and extent of sale or rental restrictions, financing available for renovations, supply and demand in housing markets, and structural protections in RMBS transactions.
- **Nevertheless, EPCs may influence property values.** Studies show there is a valuation discount for properties with low EPC classes. If this discount increases as EPC classes gain importance or is not fully reflected in property valuations, it may eventually affect how we calculate the foreclosure frequency and loss severity of RMBS loan pools.
- **Our scenario analysis shows a low potential impact on our modelled loss severity assumptions.** This is even though energy-intensive properties could face higher losses. Our weighted-average loss severity increases 2.5% at the 'AAA' rating level and 2.8% at the 'B' rating level, albeit we acknowledge that our assumptions are very conservative.
- **Foreclosure frequencies may increase over time due to higher leverage.** Property owners may incur higher debt to carry out renovations if countries start requiring improvement in energy efficiency, especially if subsidies are insufficient to cover the cost.

Our scenario analysis shows a valuation discount has a low impact on RMBS loss severity



Only 2.5% average increase in weighted average loss severity at the 'AAA' rating level.



0.8 pps is the maximum estimated rise in weighted average foreclosure frequency at the 'AAA' rating level.



About 1 pp increase in credit coverage on average at the 'AAA' rating level.

pp(s)--Percentage point(s). Source: S&P Global Ratings.

Regulation And Its Impact On The Housing Market

Targets and regulations differ by country in the EU and U.K.

The European Climate Law, which took effect in July 2021, wrote into law the European Green Deal's goal of achieving climate neutrality (net zero greenhouse gas emissions) by 2050. As part of this, EU member states are obliged to cut their greenhouse gas emissions by 55% by 2030, compared to 1990. Fit for 55, a set of legislative proposals, describes concrete actions for the EU to achieve this target.

Improving the energy performance of housing will likely be key to reaching this target, since the residential building sector was responsible for 27.4% of the EU's energy consumption in 2020, according to Eurostat, and 12% of its emissions in 2021, according to the European Environment Agency.

As part of Fit for 55, the European Commission has proposed changes to the Energy Performance of Buildings Directive (EPBD) to improve the energy efficiency of residential buildings. EPCs are a keystone of the EU taxonomy to determine whether a building is energy efficient (see box). In the U.K., the Climate Change Act requires the reduction of greenhouse gases by 100% by 2050. The U.K. has also committed to cutting emissions by 68% by 2030 under the Paris Agreement.

EU Taxonomy: Definition of energy-efficient property

Many RMBS issuers want collateral in the mortgage loan pool to show greater energy efficiency and, for some, alignment with the EU taxonomy. The EU taxonomy is primarily a classification system that clarifies which economic activities are considered environmentally sustainable, based on four overarching conditions. The activity must:

- Make a substantial contribution to at least one of the six environmental objectives (see footnote);
- Do no significant harm to any of the other five environmental objectives;
- Comply with minimum safeguards; and
- Comply with the technical screening criteria (see below) set out in the Taxonomy's Delegated Acts.

EU taxonomy technical screening criteria

Category of building	Technical screening criteria
7.7 Acquisition and ownership of existing buildings (built before 2021)	The building has an EPC of at least class A. Alternatively, the building is within the top 15% of the national or regional building stock.
7.2 Renovation of existing buildings	The renovation complies with the applicable national or regional requirements for renovations. Alternatively, it leads to a reduction of primary energy demand (PED) of at least 30%.
7.1 Construction of new buildings (built in 2021 or later)	PED, which defines the energy performance of the building resulting from the construction, is at least 10% lower than the threshold set for the nearly zero-energy building requirements for that country.

The Taxonomy's six environmental objectives are climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, and protection and restoration of biodiversity and ecosystems. Nearly zero-energy building (NZEB). According to the European Commission, an NZEB is a building with very high energy performance, while the nearly zero or very low amount of energy required is covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby. Source: EU Taxonomy.

EPC assessments vary by country but provide a measure of the energy performance of a home and recommendations to improve efficiency. An EPC is compulsory when selling or renting a property in all EU countries and in the U.K. The EPBD sets general guidelines, and each EU member state implements them in its own way. The U.K. (England and Wales) also has its own definition of the EPC. As a result, there is a variety of EPC definitions and, historically, it has been difficult to compare EPCs across European jurisdictions. EPC labels typically include a class, based on a ranking system (see graphic 1), from class A (most energy efficient) to class G (least energy efficient). The classes indicate the expected level of energy use and carbon dioxide the property emits in the number of kilowatt hours per meters squared per year (m²/year).

Graphic 1

EPC class definitions vary widely among France, Ireland, and the Netherlands

Primary fossil energy use (kWh/m2/yr)	France	Ireland	Netherlands	
0	A	A1	A++++	
10			A+++	
20				
30				
40				
50	B	A3	A++	
60				
70			A+	
80	C	B1		
90		B2	A	
100				
110		B3		
120				
130	D	C1	B	
140		C2		
150		C		
160			C3	
170				
180	E	D1	D	
190		D2		
200		E		
210			E1	
220		F		
230	F		E2	
240		G		
250			F	
260				
270				
280	G		G	
290				
300				
310				
320				
330				
340				
350				
360				
370				
380				
390				
400				
410				
420				
430				
440				
450				
460				
470				
480				
490				
500				

kWh/m2/yr--Kilowatt hours per square meter per year. We did not add the U.K. to the table because the EPC definition in England and Wales is based on a composite indicator, which is not directly comparable with EPC definitions in Ireland, France, or the Netherlands. This composite indicator is derived from a property's Standard Assessment Procedure score of 1-100 that is determined by an accredited assessor based on the home's characteristics in terms of heating system, insulation, lighting, ventilation, carbon dioxide emissions, and energy consumption, etc. Sources: France: Ministère de la Transition écologique et de la Cohésion des territoires, Ministère de la Transition énergétique; Ireland: Sustainable Energy Authority of Ireland; Netherlands: Netherlands: Rijksdienst voor Ondernemend Nederland – RVO (Netherlands Enterprise Agency); and S&P Global Ratings.

Countries have differing approaches to defining minimum EPC classes for residential property rentals. France and the U.K. have already put in place regulations that set a minimum EPC class for rental properties (see table 1). In the case of the U.K., these prevent properties from being rented unless they meet the minimum EPC class. In France, rents are frozen until the minimum EPC class is met and, in the future, landlords will be prevented from renting properties with low EPC labels; the Netherlands has also put in place policy that will apply in the future. So far, Ireland has not announced any rent restrictions related to energy efficiency (see graphic 2).

Table 1

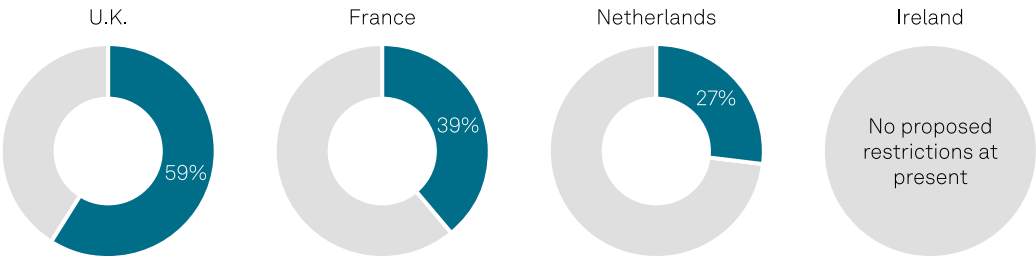
Sample of building energy efficiency regulations for property rentals by country

Jurisdiction	Energy efficiency regulation
France	The French government has implemented bans on renting properties with low EPC classes. Since August 2022, rents of properties labelled as class G and class F have been frozen. Since January 2023, properties with energy consumption exceeding 450 kWh/m2/year cannot be rented. Starting in 2025, all properties labelled class G will be banned from the rental market, followed by class F in 2028, and class E in 2034.
Ireland	In Ireland, EPCs are called Building Energy Rating (BER) certificates. The government has not implemented any restrictions on the rental market with respect to BERs at this time.
Netherlands	In the Netherlands, properties labelled class E, F, and G will be banned from public and private rental markets starting January 2030. From 2026, when a heating installation needs to be replaced, the switch must be to a "greener" system, notably hybrid heat pumps.
U.K. (England and Wales)	Since April 2018, all rented properties must have a minimum EPC label of class E. More recently, the U.K. government has proposed to ban all properties with EPC labels lower than class C from being rented from 2028. This policy is still in development and has not been legally implemented yet. In our view, the main risk is a property value decline for low energy-efficient homes if landlords decide not to renovate and, instead, sell their properties. If a landlord does not renovate and continues to rent out the property, they can be fined.

Sources: France: Loi Climate et Résilience (Law of Climate and Resilience; 2021); Netherlands: Beleidsprogramma versnelling verduurzaming gebouwde omgeving (Policy program to accelerate the sustainability of the built environment; 2022); U.K. (England and Wales) - UK Minimum Energy Efficiency Standards (MEES) regulations (2018); and S&P Global Ratings.

Graphic 2

Share of housing stock subject to potential rental bans over time, based on the EPC class



EPC--Energy performance certificate. Sources: U.K. (England and Wales): U.K. government; France: fidéli, SDES data; The Netherlands: CFP Green Buildings; and S&P Global Ratings.

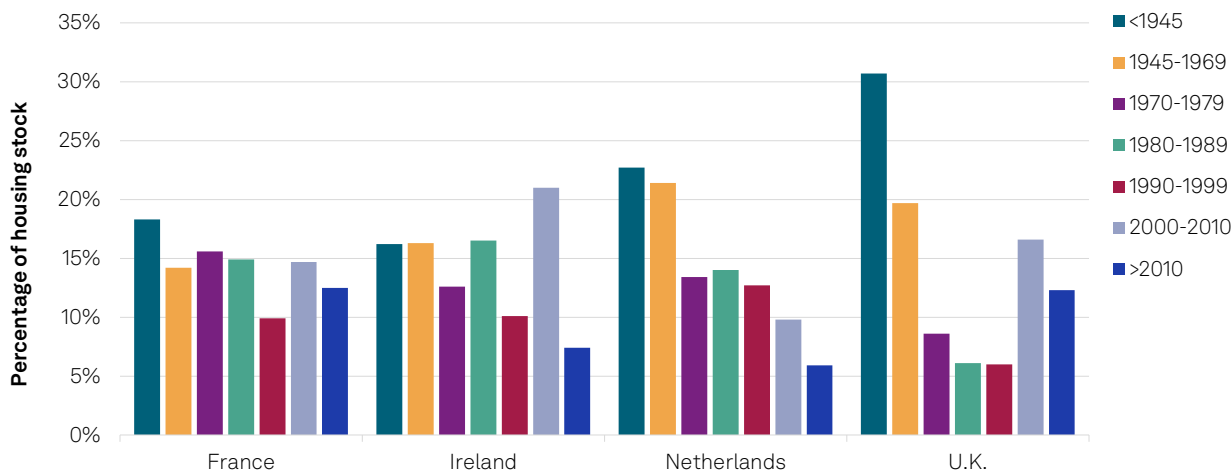
The proposed EPBD aims to introduce a unified definition of the EPC across EU member states and set a binding timeline for renovations and EPC upgrades. The draft EPBD would require all existing residential buildings to have a minimum EPC label of class F by 2030 and class E by 2033, and all new buildings to generate net zero emissions by 2030. The U.K. implemented the 2018 EPBD (the most recent revision) after the referendum in which the U.K. voted to leave the EU, and it has been in effect since 2020. However, the U.K. does not participate in the new EPBD discussions.

Old houses may require more renovation to improve energy efficiency

Research from the European Commission and the EU Building Stock Observatory finds that the U.K. has one of the oldest housing stocks in Europe, with half of its dwellings built before 1970 (see graphic 3). Although 44% of residences in the Netherlands were built before 1970, the country has one of the highest shares of energy-efficient properties in Europe, based on the reported distribution of EPC classes. However, EPC definitions are not directly comparable across countries at present. In each of the four countries, about 40% of residential homes are rented (see graphic 4) and could be affected by potential regulations banning the rental of properties with low EPC classes.

Graphic 3

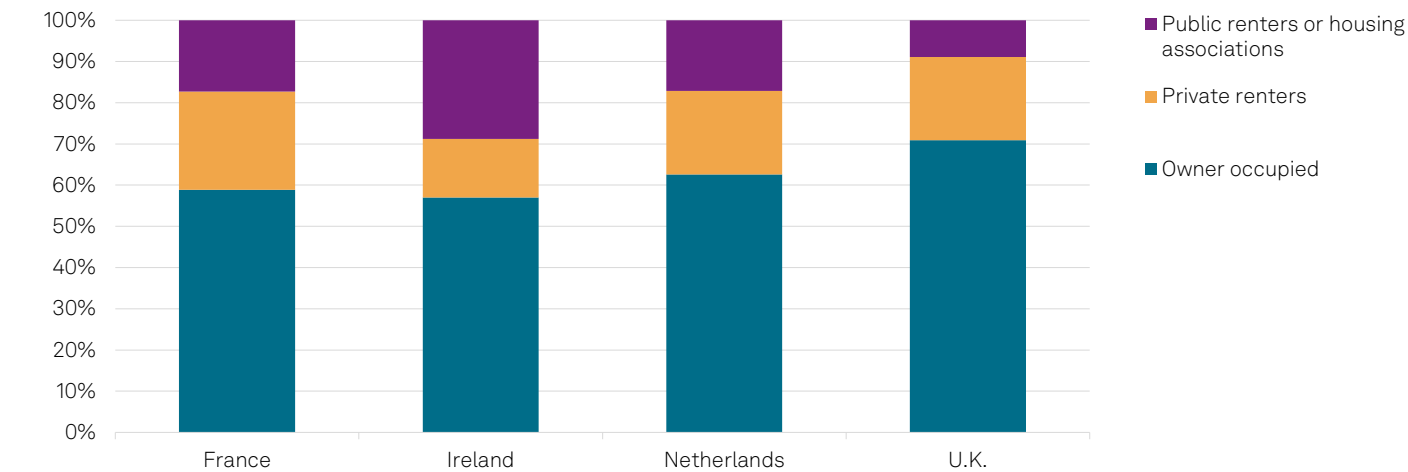
The age profile of residential housing varies across Europe



Sources: European Commission, EU Building Stock Observatory, 2017 data; and S&P Global Ratings.

Graphic 4

Distribution of homes by residential ownership type



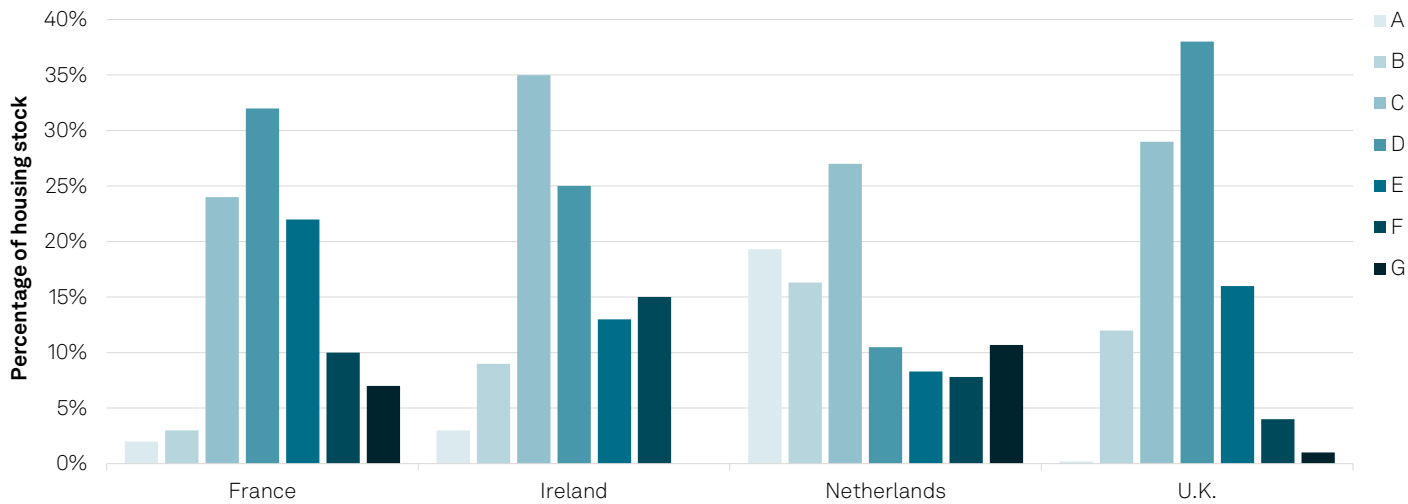
Sources: France: INSEE, 2022 (share of residential primary homes), Ireland: Central Statistics Office, 2016 (share of households), Netherlands: CBS 2021, Kadaster 2021 (share of residential housing units), U.K. (England and Wales): U.K. Government, 2021 (share of households); and S&P Global Ratings.

EPC data reporting is inconsistent among jurisdictions

The distribution of residential buildings by EPC varies greatly across countries, due to the specific features of housing, processes for assigning EPC classes, and the variety of EPC class definitions (see graphic 5). National databases are publicly available in France, the Netherlands, the U.K., and Ireland. By looking at the distribution of EPCs across countries, we cannot conclude that a certain country has more energy efficient buildings than another because the EPC definitions are not directly comparable. For instance, a property with 155 kilowatt hours per m2/year of primary fossil energy use could have an EPC label with class D in France and class A in the Netherlands.

Graphic 5

EPC classes vary widely across countries



Note: The EPC distributions across countries are not directly comparable given the differences in EPC class definitions presented in graphic 1. Sources: England and Wales: U.K. government; France: fidéli, SDES data; Ireland: Central Statistics Office; the Netherlands: CFP Green Buildings. Ireland data combines EPC classes F and G. Data as of 2019 (Ireland), 2020, Netherlands, 2022 (England and Wales, France), and S&P Global Ratings.

As part of a new European Banking Authority regulation, banks will be required to disclose information on the climate exposure of their real estate portfolios from December 2023. As a result, many banks have started to capture EPCs during the loan origination process, and some of them map existing properties to the national database when available. However, most banks are at an early stage of development in this area, and it will take time to collect enough data to create a meaningful sample. As more EPC data is provided over time by securitization issuers, it should help to enhance the understanding and monitoring of the potential relevance of EPC-related valuation and collateral risks.

Lower EPC classes could affect property values

Many of the studies we consulted (see the External Research list at the end of this report) that were conducted across Europe show that a discount exists for properties with the lowest EPC classes (F and G), both in the owner-occupied and buy-to-let (or BTL) markets. The magnitude of the discount varies, depending on the type of property, price segment, location, market tightness, and market sentiment. A number of studies argue that energy performance of a home is highly correlated with its date of construction.

Nevertheless, some studies have rejected the date of construction as an indicator and instead demonstrated that lower EPC classes themselves constrain property valuations. Some of them show that the discount has increased in the last few years and is likely to rise further in the coming years as public awareness of climate risks for the housing sector increases. Some academic studies also report a premium for energy-efficient properties, in several markets.

Lower EPC classes can be associated with higher energy and renovation costs. They can also reflect lower comfort, both in winter and during summer heat waves, notably if the property is badly insulated. In the buy-to-let market, low EPCs can cause higher vacancy rates, lower rents, and eventually a lower valuation; however, this depends on the market's location and conditions.

Financing Will Likely Be Needed For Renovations

The cost of renovation varies widely

Generally, renovation costs depend on the type of property, the EPC class targeted, and the types of work. Light renovation refers to conducting only one or two types of works that might raise the EPC label by one class, such as replacing an oil boiler with an electric boiler. A deep renovation encompasses several types of works, such as replacing a boiler, and the insulation in walls and the roof, to raise the label to class A or B. The types of retrofit necessary to improve energy performance generally include walls and attic insulation, as well as replacement of heating systems, controls, or ventilation.

Although most countries included in our scenario analysis offer grants to retrofit homes (see table 2), we find the amount, conditions, and processes for receiving such a grant vary greatly across countries. In most cases, grants are conditional upon a household's income and the type of work. Governments can also provide incentives to owners through subsidized loans, tax credits, or reduced value-added tax.

When grants are not sufficient or available, owners may finance works out of their own pocket or from further borrowing (secured or unsecured). Financing solutions vary across countries. However, when purchasing a property, it is common to finance renovation through the mortgage loan, with the cost of renovation reflected in the loan's current balance once the amount dedicated to the works is released by the lender (most of the time upon presentation of invoices).

Barriers to energy-performance improvements remain

Government grants do not generally provide a sufficient incentive for owners to renovate their homes. This is because such grants typically do not cover the whole cost of renovation and the amount and types of grants vary widely across countries. In addition, the costs of renovation often exceed the benefits of increasing the property's valuation and reducing energy bills, unless, for the latter, the owner intends to keep the property for a long time. There is also the possibility that EPC regulations could evolve in the coming years. Therefore, owners are often uncertain whether renovations will be sufficient to achieve the minimum EPC class for rental when standards are constantly raised.

For homeowner associations, it might be difficult to pursue works that have to be approved by all owners. This is particularly the case for landlords when owner occupiers make up the majority of homeowners in the building. Also, deep renovations cannot be done if the property is not vacant.

Sometimes, unwillingness to renovate stems from a lack of information, for example about the costs, types of works needed to improve energy performance, and how to find a contractor. In several countries, renovation grants are conditional upon the works being conducted by a certified contractor. However, there may not be sufficient certified contractors to do all the renovations required to meet the EPC target. In some cases, renovations are not doable because of the property's features, such as lack of a cavity for insulation or the building's classification as a historical monument. Raw material shortages and cost inflation can also hinder completion of renovations.

How EPCs Might Influence Our Credit Analysis

Renovation costs could be credit negative, absent mitigating factors

A homeowner or landlord may seek additional financing upon buying a property with a low EPC class to complete energy-efficiency upgrades. If that homeowner or landlord decides to finance the renovation through a mortgage loan, the cost would be reflected in the mortgage loan balance once the lender releases the amount dedicated to the works. This could impair several ratios we consider in our loan foreclosure frequency analysis, including the loan to value (LTV), loan to income (LTI), debt to income (DTI; relevant for French RMBS transactions) and debt service coverage (DSC; relevant for buy-to-let transactions in the U.K. and Ireland).

However, in our view, several factors could mitigate the impact:

- Whether the loan is new or seasoned, the lender will consider the additional financing subject to the maximum LTV, LTI, DTI, and interest coverage ratio limits, as per its underwriting criteria, which cannot be exceeded. In a seasoned loan, the borrower can benefit from the loan's amortization since origination (unless it is an interest-only loan) and from any increase in primary income. The borrower could also benefit from a potential increase in house prices since origination.
- In addition, if the EPC class improves due to renovation, the property value will likely also improve. The renovation cost's potential weight on the LTV--and therefore on our foreclosure frequency assumption--would be at least partly mitigated by the increase in property value. However, it is hard to assess the magnitude of the rise in value after renovation because this depends on many factors, such as the types of renovation, market location, and market sentiment.

- For buy-to-let properties, another mitigant is that the rental income could increase after the property is renovated, especially if the EPC class improves from a low-efficiency class. A higher EPC class (the A classes are the highest) is typically associated with lower energy costs and potentially higher rent.

Effect of property valuation haircut on the WAFF and WALs

To simulate the hypothetical impact on the weighted average foreclosure frequency (WAFF) and weighted average loss severity (WALS), we applied an average 15% haircut to the valuation of low-energy-efficient properties backing a mortgage loan pool. Climate transition risk may materialize through potential property valuation discounts for such properties if the owners do not undertake any renovations.

We use EPC class distributions to indicate this risk in our scenario analysis. We assume the main effect would be lower property sale proceeds after a repossession in case of a borrower default, and therefore a higher WALs. This risk could also affect our stressed WAFF assumptions by reducing the current LTV ratio, therefore influencing the effective LTV ratio we use to determine our LTV adjustment. This is because 80% of the effective LTV represents the original LTV and 20% the current LTV. However, this aspect is less significant to our scenario analysis than the potential increase in WALs.

Components Of The Scenario Analysis

Assumptions

Valuation haircut of 15% for the average cost of renovation. A valuation haircut equals the estimated cost of renovation. In other words, the property's market value fully discounts the estimated costs to improve its energy efficiency. Research papers mention costs of renovation ranging from approximately 8% of the property value, for a light renovation, to 25% for a deep renovation. With the variety of renovations possibly required, we assumed an average cost of renovation of 15% in all markets and for all properties.

A larger haircut (20%) for buy-to-let (BTL) properties than for owner-occupied properties (15%). We distinguish between BTL and owner-occupied properties in our scenario because the energy-efficiency requirements announced by some countries to date apply only to rental properties. As a result, we believe there could be a relatively higher valuation discount on rental properties with a low EPC class, since some landlords may choose to sell rather than carry out improvements, and there could be less demand for those properties on the BTL market.

In France and the Netherlands, properties with EPC classes F or G are assumed the first affected by the ban on renting properties with low energy efficiency. In the U.K., currently all properties to be rented should have an EPC class of at least E. In addition, properties with low energy efficiency on the rental market might be subject to higher vacancy rates and potentially lower rental prices, since tenants avoid properties with high energy costs; this may then be reflected through a lower property value.

However, the magnitude of discount would depend on a variety of factors, such as market location, type of property, price range, and market sentiment. For instance, in markets where the supply of BTL properties is low, the discount is generally lower. The discount for BTL properties would also be mitigated by demand for owner-occupied property to a certain extent. When a landlord sells a low-energy-efficient BTL property, a first-time or low-income buyer that can

afford the property, because of the discount, may purchase it without being obligated to renovate, since they plan to occupy the property rather than rent it out.

30% of the mortgage loan pool comprises low-energy-efficient properties. EPC data is not required when submitting individual mortgage loans to securitization repositories, and we typically do not receive the EPCs of properties backing rated RMBS transactions. Many originators now request EPCs during the loan underwriting process, so data availability may improve over time. But for seasoned loans, EPC data is not widely reported; therefore, we use a proxy.

To determine the percentage of a collateral pool comprising low-energy-efficient properties, we considered the new definition of the G class under the proposed EPBD. The G class will reflect the bottom 15% of all residential properties in the EU in terms of energy efficiency. This means some properties currently labelled class F will be considered class G, and some labelled class E will be considered class F. For our scenario analysis, we assumed that both class F and class G properties will account for a maximum 30% of residential property in the future.

For simplicity, we applied the same assumption for the U.K., although the current distribution of classes F and G in the housing stock is currently very low, and we are uncertain how the EPC framework might evolve compared to that in the EU. However, with a potential new U.K. law targeting rental properties with EPC classes lower than C, a higher share of loan pools might be affected than the 30% we assume for our scenario analysis.

Calculating the total haircut applied at pool level

To do this, we take the sum of:

- 15% of the assumed property value discount for owner-occupied properties, multiplied by the share of owner-occupied properties in the pool, multiplied by 30%, which is the assumed share of properties with EPC classes F and G; and
- 20% of the assumed property value discount for BTL (buy-to-let) properties, multiplied by the share of BTL properties in the pool, multiplied by 30%, which is the assumed share of properties with EPC classes F and G.

For example, if a pool contains 40% owner-occupied properties and 60% BTL properties, we would apply a haircut of 5.4% at pool level.

We applied the valuation haircut to the current indexed valuation and on top of any valuation haircut already applied under our rating criteria

Sample RMBS transactions

We used a representative sample of eight transactions, including prime, nonconforming, and BTL assets in the U.K., Ireland, France, and the Netherlands to assess how our scenarios affect the WAFF and WALs. The ratings on these transactions range from 'AAA (sf)' to 'B (sf)'.

Some limitations and caveats to our scenario analysis

- The stresses we selected are hypothetical, are not meant to be predictive, and may not be a precise representation of reality.
- We apply declines in house prices immediately, which we believe is a conservative assumption because the timing and final form of any energy efficiency regulations that could influence property valuations remains highly uncertain. In our view, any future decline in property values for low-energy-efficient properties is likely to occur gradually and--in the

- meantime--borrowers with amortizing loans would continue to reduce their outstanding balances, which may mitigate any deterioration in the LTVs at that time.
- In addition, an appreciation of overall property market prices in the long term would contribute to lower LTVs and reduce the impact of declines versus that in our scenario analysis.

Results of the scenario analysis

Table 2

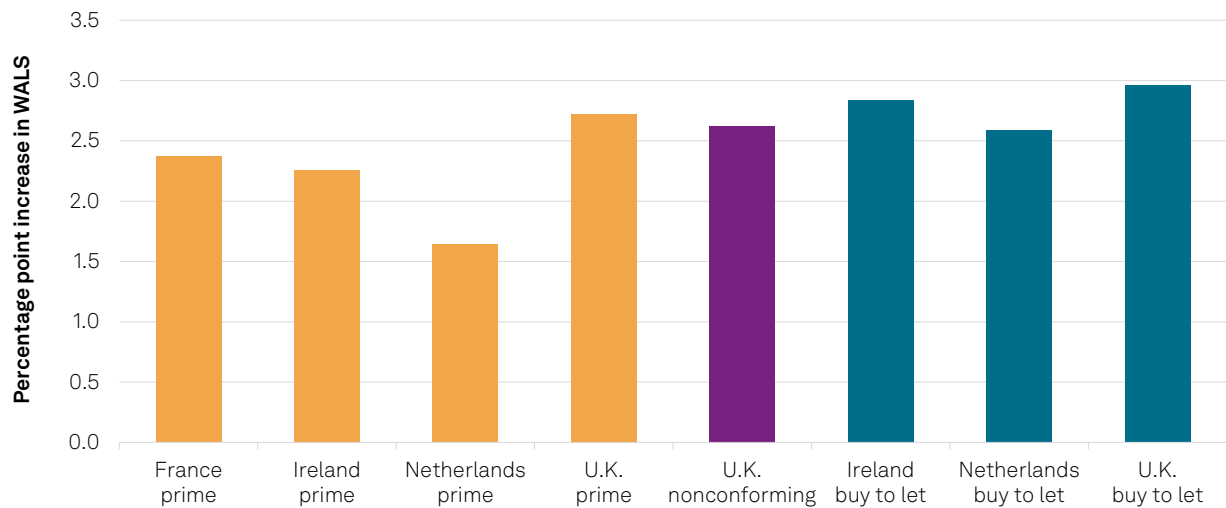
Haircuts and the impact on the WAFF and WALs

Country	Type of transaction	Share of owner-occupied properties (%)	Share of buy-to-let properties (%)	Valuation haircut applied for sensitivity* (%)	Increase of WAFF at 'AAA' rating level\$	Increase of WALs at 'AAA' rating level\$	Increase of credit coverage at 'AAA' rating level\$	Increase of WAFF at 'B' rating level\$	Increase of WALs at 'B' rating level\$	Increase of credit coverage at 'B' rating level\$
France	Prime	65.1	34.9	5.00	0.14	2.37	0.41	0.02	0.79	0.02
Ireland	Prime	100.0	0.0	4.50	0.79	2.26	0.74	0.10	2.10	0.08
Ireland	BTL	0.0	100.0	6.00	2.14	2.84	2.26	0.30	3.70	0.37
Netherlands	Prime	100.0	0.0	4.5	0.14	1.64	0.16	0.02	0.96	0.01
Netherlands	BTL	0.0	100.0	6.00	0.28	2.59	0.62	0.04	4.25	0.12
U.K.	Prime	100.0	0.0	4.50	0.78	2.72	0.96	0.12	2.66	0.11
U.K.	BTL	0.0	100.0	6.00	1.17	2.96	1.40	0.17	4.70	0.21
U.K.	Nonconforming	65.4	34.6	5.00	0.94	2.62	1.19	0.15	3.06	0.19

*On top of existing valuation haircut applied under our RMBS methodology, if any. \$In percentage points. BTL--Buy to let.
Source: S&P Global Ratings.

Graphic 6

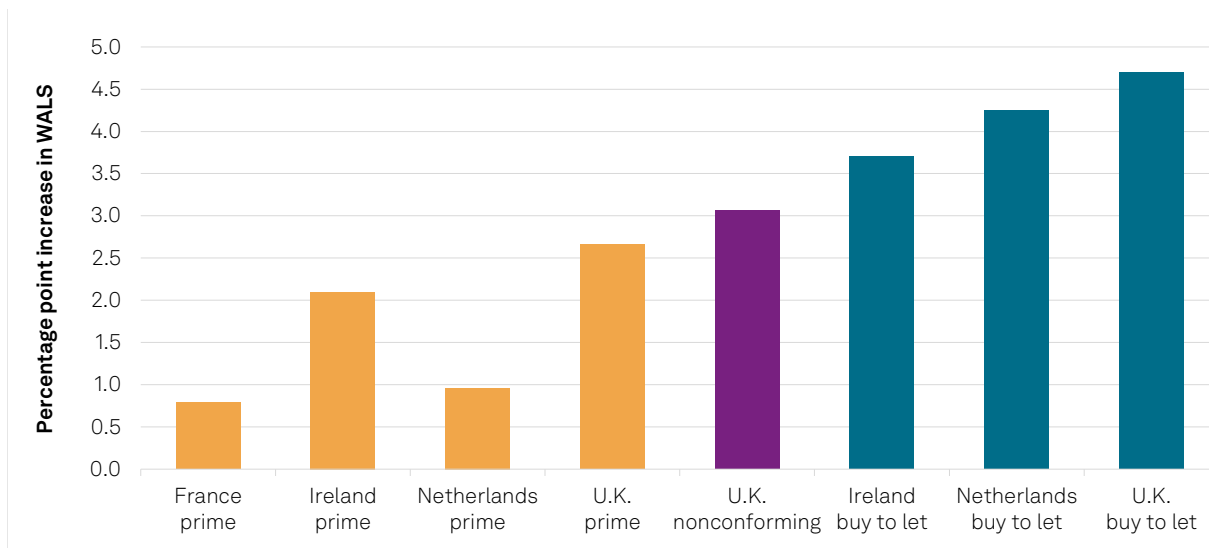
Effect on WALs: Additional percentage points at the 'AAA' rating level



WALS--Weighted average loss severity. Source: S&P Global Ratings.

Graphic 7

Effect on WALs: Additional percentage points at the 'B' rating level



WALs --Weighted average loss severity. Source: S&P Global Ratings.

Main findings: Overall influence on loss severity is relatively low

After applying the value discount in our scenario, we saw an increase of only 2.5% in the WALs for RMBS at the 'AAA' rating level and 2.8% in the WALs for RMBS at the 'B' rating level, on average. This is before considering any mitigating factors such as a gradual rather than an instant decline in property values for low EPC classes, continued deleveraging, or price appreciation of properties over time. This does not reflect any offsetting benefit from higher valuations of properties with high EPC classes in mortgage collateral pools, which may benefit from climate transition policies.

Unsurprisingly, a high share of BTL properties in a mortgage pool correlates with a higher influence on the WALs in our scenario analysis. The impact on the WAFF is limited, with an increase of only 0.8 percentage points overall at the 'AAA' rating level, and 0.12 percentage points at the 'B' rating level.

The effect on credit coverage is low, with an average increase of 0.97 percentage points only at 'AAA' and 0.14 percentage points at 'B'. This shows that the higher loss severity as a result of a property value discount for low energy efficiency would have only a limited effect on our cash flow analysis, especially when the WAFF is low.

Structural features in RMBS transactions could mitigate the risk of reduced property valuations for low-energy-efficient homes. First, at an individual loan level, borrowers generally repay principal over time, which reduces the potential loss severity if they default. Additionally, although we do not give credit for future house price appreciation in our RMBS analysis, house price increases can reduce LTVs over time. RMBS structures differ from transaction to transaction. Generally, however, RMBS structures often have generic structural features that provide stability to our RMBS ratings. Structural mitigants often include some or all of the following:

- **Sequential amortization of rated notes**, meaning that higher-rated notes are repaid before lower-rated notes and credit enhancement often increases over time for all notes.

- **Hard credit enhancement.** This refers to tangible forms of credit enhancement, such as reserve funds, overcollateralization, or unrated subordinated notes. Generally, hard credit enhancement would cover any losses on the sale of underlying mortgage collateral before it is allocated to the rated RMBS.
- **Soft credit enhancement.** This generally takes the form of excess spread and, if available, can be used to cover any losses on the sale of property underlying the RMBS.

Looking Ahead

Our scenario analysis enables a better understanding of the range of possible exposures that issuers of RMBS face and may enhance our dialogue with issuers and market participants regarding future climate transition risks and any related mitigants.

The scenarios in this research illustrate how EPC-related variables could in the future influence RMBS credit-rating analytics. However, they are not considered in our current assumptions for securitized mortgage loans because of uncertainty regarding the timing and extent of any legal obligation to renovate properties to reach some mandated minimum level of energy efficiency. Furthermore, there is limited visibility on the required amount of financing for renovations and any resulting effect on property valuations.

The valuation discount of homes with the lowest energy efficiency could be significant if owners do not do the renovations. Moreover, in countries that already have or may implement rental market bans based on EPCs, BTL properties with low energy efficiency might be subject to higher vacancy rates and lower rents, and therefore even lower valuations. Therefore, in our view, mortgage loan pools with a high share of BTL properties may present a higher credit risk in the future. In RMBS transactions backed by nonperforming loans, the main risk would be lower sale proceeds if property is repossessed, due to the discounted value of low-energy-efficient properties.

Appendix

Table 3

Sample of government and private lender support for building renovations by country

Jurisdiction	Government and regulatory support for renovation	Banks/lenders energy-efficiency financing solutions
France	<p>--The French government offers grants for homeowners and landlords to finance energy performance improvements. The amount is up to €11,000 and depends on household income and energy improvement. A specific scheme for low-income borrowers offers grants up to €17,500.</p> <p>--The government has introduced subsidized interest-free loans (Eco-PTZ) up to €50,000, available for all owners, for energy performance renovation, in partnership with main banks. The maximum term is 20 years. Low-income households can benefit from a specific renovation mortgage loan and the state guarantees up to 75% of the amount.</p> <p>--There are many local grants available, and the value-added tax for energy performance works is reduced to 5.5% instead of 20%.</p>	<p>--In France, light renovations are often financed through a consumer loan and deep renovations through a residential loan.</p> <p>--All main banks offer interest-free loans (Eco-PTZ) in partnership with the government.</p> <p>--Some banks have set tighter underwriting criteria to purchase BTL properties with an EPC class of G or F, requiring borrowers to commit to renovate the property (evidence via quotations or invoices is required). If the borrower does not commit to renovate, then the rental income is excluded from the debt-to-income ratio calculation.</p>
Ireland	<p>--Government grants are available for all homeowners and private landlords and managed by the Sustainable Energy Authority of Ireland. The grants, of up to €6,000, are for a variety of works including attic and wall insulation, heating upgrades, solar panels, and heat pumps. A specific, fully-funded grant scheme is also available for qualifying homeowners that already get welfare benefits.</p>	<p>--The cost of renovation can generally be financed through a mortgage loan.</p> <p>--Some originators have launched green mortgage loans, with lower rates, for borrowers purchasing a property with a high energy performance assessment or conducting home improvement works to increase the energy performance assessment.</p>
Netherlands	<p>--The government offers subsidies to homeowners and renters for home energy efficiency renovation. Installation must be completed to apply for the subsidy, based on quotations, invoices, and photos. The amount of subsidy depends on the number and types of works, and equipment used.</p> <p>--Local subsidies are also available.</p> <p>--The National Heat Fund, funded by the Dutch government and banks, provides homeowners and landlords with cheap consumer loans for home renovation. Interest-free mortgage loans exist for low-income households.</p>	<p>--Renovation is typically decided when a property is purchased, and often financed through a construction deposit released to the borrower after the renovation has been completed.</p> <p>--Home energy performance has become a marketing strategy for Dutch lenders to distinguish themselves. Some propose discounted interest rates for loans backed by properties with strong EPCs, or when the borrower commits to renovate the property and improve the EPC class. Lenders also offer tools to help borrowers get information on energy performance renovation.</p>
U.K. (England and Wales)	<p>--The Energy Company Obligation (ECO4) and ECO+ schemes are funded by the main energy suppliers. ECO4 targets low-income homeowners or tenants in energy inefficient properties and can finance insulation, boiler replacements, electric heating, draught proofing, heat pumps, and solar panels. ECO+ targets both low-income and middle-income households with grants of up to £15,000 to finance mostly insulation. About 80% of the scheme is dedicated to homes with an EPC class of D or lower.</p> <p>--The Home Upgrade Grant is funded by the government's Local Authority Delivery scheme. It targets both homeowners and private renters to finance various measures, including insulation and low-carbon technologies.</p> <p>--The Boiler Upgrade Scheme, funded by the government, offers grants of up to £6,000 to finance heat pumps and biomass boilers.</p>	<p>--The cost of renovation can generally be financed through a mortgage loan. Some homeowners and landlords benefit from increased property values and amortization since their initial loan, which can help finance the costs through their existing mortgage loan.</p> <p>--There are some initiatives from lenders to create specific offers related to energy efficiency. Some originators have decreased the interest rate on their green additional borrowing product to 0%. However, only a limited number of mortgage holders could benefit from this green product.</p>

Sources: France: Ministère de l'Économie des Finances et de la Souveraineté Industrielle et Numérique (Ministry of the Economy, Finance and Industrial and Digital Sovereignty); Ireland - Sustainable Energy Authority of Ireland; Netherlands: Rijksdienst voor Ondernemend Nederland – RVO (Netherlands Enterprise Agency); UK (England and Wales) - Ofgem, Department for Energy Security and Net Zero; and S&P Global Ratings.

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