



EeMAP

Energy efficient
Mortgages
Action Plan



CREATING AN ENERGY EFFICIENT MORTGAGE FOR EUROPE

A review of the state of play on 'green' finance



Established in 1967, the EMF is the voice of the European mortgage industry, representing the interests of mortgage lenders and covered bond issuers at European level. The EMF provides data and information on European mortgage markets, **which were worth around EUR 7.0 trillion at the end of 2016**. As of September 2017, the EMF has 17 members across **14 EU Member States** as well as a number of observer members. In 2004 the EMF founded the ECBC, a platform bringing together covered bond issuers, analysts, investment bankers, rating agencies and a wide range of interested stakeholders. As of September 2017, the ECBC has 116 members across more than 30 active Covered bond jurisdictions and many different market segments. ECBC members represent over 95% of Covered bonds outstanding, which were worth nearly 2.5 trillion EUR at the end of 2016.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
1. Introduction	6
1.1 Bridging the divide between energy efficient buildings, valuation and finance	6
CURRENT STATE OF PLAY OF GREEN FINANCE	7
2. Mortgage origination & green buildings	7
2.1 Experience of green mortgages & motivation	7
2.2 Originating green mortgages	8
2.3 Market research & communication	8
3. Risk management, data & valuation	9
3.1 Risk management	9
3.2 Data	9
3.3 Property valuation	10
4. Energy efficiency measurement & internal procedures	11
5. Green funding market	12
5.1 Green issuer perspective	12
5.2 Green investor perspective	15
6. Transparency & market initiatives	16
7. Institutional & international perspective	16
8. Analysis of findings	18
9. Conclusion & key messages	19

EXECUTIVE SUMMARY

Buildings account for 40% of EU energy use, and it is estimated that the EU needs to invest around €100 billion annually in building renovations to meet its energy and climate goals. The EU has increased the amount of public funds available for energy efficiency, but the European Commission has indicated that there is a need to boost private energy investments – the EeMAP (Energy-efficiency Mortgage Action Plan) Initiative is intended to deliver a concrete, market-led finance solution to help bridge the gap.

Mortgage lenders have a clear interest in the state of the EU building stock. Mortgage loans are estimated to account for around a third of the total assets of the European banking sector. Investments in building performance improvements can help to free-up disposable income for borrowers through lower utility bills and can enhance property value. As a result, they can reduce credit risk, so they are a win-win for lenders, investors, consumers and climate.

***Our Vision:** The EeMAP project (www.energyefficientmortgages.eu) aims to create a European energy efficient mortgage (EEM), to incentivise borrowers to improve the energy efficiency of their buildings or acquire highly energy-efficient properties. The incentives the EEM will offer borrowers (e.g. reduced interest rates and/or increased loan amount) aim to reflect the reduced credit risk of these loans.*

This Report aims to present an up-to-date overview of the state of play of green finance in Europe, with an emphasis on energy efficiency where possible, by reviewing and analysing current market practices on both the origination and funding side of the mortgage business. In doing so, this Report offers an insight into how green financial products vary across financial institutions and national markets and proposes future recommendations on which the EeMAP Initiative can move forward by identifying and evaluating key characteristics which an Energy Efficient Mortgage product should encompass in order to meet the needs of financial institutions and consumers. This Report summarises the findings of comprehensive market research and stakeholder interviews. The Report covers EU Member States and key international markets.

On the origination side, the Report investigates past and current examples of green finance in order to understand potential obstacles and reasons for financial institution to refrain from entering the market. Feedback suggests that while green finance products represent a growing share of the portfolio for some financial institutions, perceived lack of market interest together with operational and technical considerations are discouraging others from entering the market. The Report explores the key features of those green products already available in the market and considers the obstacles identified to further development of the market.

One of the key premises of the EeMAP Initiative is that energy efficiency has a positive impact on credit risk. As far as the extent to which energy efficiency is therefore taken into consideration from a risk management perspective among financial institutions in Europe, almost all those interviewed reported that at present no differentiation is made in their risk management processes between green and conventional mortgages in relation to probability-of-default (PD), loss-given-default (LGD), debt-to-income (DIO), loan-to-value (LTV), prepayment rates etc. Furthermore, the loan data of very few financial institutions would allow for a comparison of LGD and increased asset value and a correlation to be drawn between PD, LGD and the energy rating of the property in question nor could it be used to show any increase in value due to energy performance improvements. However, in both of these cases, it is generally agreed that if a differentiation were clearly made between energy efficiency and conventional mortgages, it would be possible to collect relevant data and then analyse it.

In this respect, it is worth recalling, as the Report does, that while different lines of thinking exist on whether green features impact the risk profile of a financial product, and whether therefore there is a case for reviewing the current capital framework to take account of energy efficiency, the current lack of standardised dataset of such products must be overcome in order for the case to be made for a realignment of capital charges to reflect the potential positive impact of energy efficiency on credit risk.

***Key Message 1:** A simple and standardised framework for an energy efficient mortgage would help to pave the way to potential market entry, while a clear definition of an energy efficient mortgage (see Chapter 8 for more details in this respect) would help banks to make a clear differentiation between energy efficient and conventional mortgages in their risk management processes, and in this way build datasets.*

Remaining on the subject of risk management, property valuation plays a fundamental role for banks in managing the risks associated with lending. It therefore follows that if energy efficiency has a positive impact on credit risk, energy efficiency should be taken into account in property valuations. However, the Report finds that, at the current time, only a small number of financial institutions take account, under certain circumstances, of energy parameters, such as the EPC, in the valuation of property for lending purposes. The Report furthermore finds that only a small number of financial institutions specifically instruct valuers to report on energy efficiency in valuation reports.

***Key Message 2:** Guidance for banks on how and what to instruct property valuers in relation to the energy performance of buildings would help to ensure that energy efficiency is appropriately taken account of in property valuations. This guidance can draw experience from other EU funded projects with a specific focus on sustainability/energy efficiency of buildings and property valuation, namely RenoValue¹ and REValue².*

The Report continues by also examining the question of energy efficiency measurement within financial institutions' internal procedures in order to understand how energy efficiency can be factored into credit risk assessments to justify the preferential financing conditions of the Energy Efficient Mortgage as per the EeMAP Initiative's financing mechanism. In this respect, the Report shows that some financial institutions collect energy-related data for the purpose of originating 'green' mortgages. Significantly, many of those financial institutions which report that they do not collect such data at present indicate that **their IT systems could be adapted to allow for such information to be recorded.** The main challenge to do so, as highlighted by banks, however is the **current lack of harmonised energy efficiency measurement criteria.** In this respect, it is important to note that other research being conducted under EeMAP suggests that **the introduction of a harmonised system across the EU will be difficult to achieve due to differences in Member States approaches to measurement.** Nonetheless, the same research also suggests that **a system of comparable processes/frameworks – allowing for the integration of national standards and approaches – could be a feasible and successful alternative.**

Key Message 3: *Simple and proportionate energy efficiency measurement parameters, based on comparable processes/frameworks across the EU, indicating the nature of the energy data to be collected, would help financial institutions to integrate energy efficiency into credit risk assessments.*

From a funding perspective, the Report investigates the state of play of the green funding market and confirms that **although they remain for the time being relatively 'niche', green and sustainable bonds are a fast-growing capital market segment drawing much attention.** The Report specifically

examines the green bond programmes of a small number of 'pioneers' by way of a series of case studies. **Of those financial institutions which have no previous or current experience with green bond issuance, several indicate that internal discussions regarding future green issuance are taking place.** In terms of green/sustainable bond pricing, feedback received indicates that **at the current time the market does not really distinguish between green/sustainable bonds and conventional bonds,** however, despite this, it is **apparent that green funding instruments are attracting new investors to the table.**

From the perspective of green investors, while the Report finds that the majority do not have experience with green investments, **some investors report that current political and market-driven developments could make a case for entering the market.** As the case studies used for this Report show, there is reason to believe that **there is significant market potential for the green/sustainable bond market, and several financial institutions interviewed for this Report anticipate robust investor demand for energy efficient mortgage-based securities going forward.**

The Report also provides an overview of the international experience of green/energy efficient finance with a view to identifying useful benchmarks and best practice.

In concluding, the Report points to **strong appetite from market participants to enter the market, despite the relative infancy of the market** at the current time, **provided the necessary preconditions are in place,** the delivery of which are at the heart of EeMAP. It furthermore highlights not only the importance of ensuring consumer demand, by increasing consumer awareness of the benefits of energy efficiency and the future existence of an Energy Efficient Mortgage product and framework, but also the **importance of strong EU institutional support, particularly during the forthcoming pilot phase,** during which a **minimum viable energy efficient mortgage product will be trialled with banks.**



1 — The [RenoValue](#) project developed a training tool kit for property valuation professionals on how to factor sustainability into the valuation process.

2 — [REvalue](#) aims to incorporate energy efficiency into stock valuation by way of expert panels, data analytics and case studies.

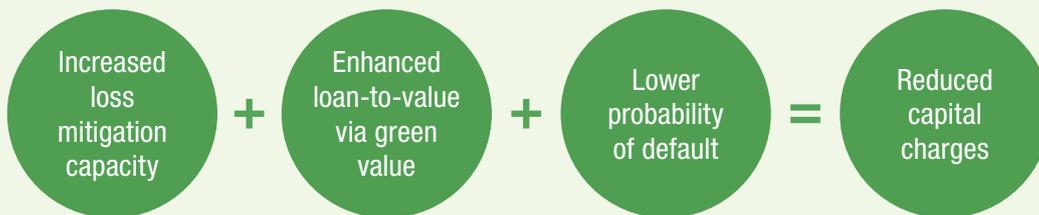
1. INTRODUCTION



EeMAP Energy efficient Mortgages Action Plan

The EU Horizon 2020 funded EeMAP Initiative aims to create a standardised energy efficient mortgage (EEM), that will incentivise building owners to improve the energy efficiency of their buildings or acquire an already energy efficient property by way of preferential financing conditions (reduced interest rates and/or increased loan amount) linked to the mortgage.

At the heart of the initiative is the objective to demonstrate that energy efficiency has a risk mitigation effect for banks.



Lower risks deliver a strong incentive for banks to enter the market and play a central role in driving climate action across Europe's building sector.

established from the different perspectives of finance (both origination & funding), valuation and energy efficiency measurement.

This report is one of a series of four produced by the EeMAP Initiative, which respectively review the state of play in relation to energy efficiency, valuation, finance and probability of default in the context of the EU's building stock. The reports are aimed at banks and other financial institutions interested in understanding how an EEM could be

Both new build and existing residential and non-residential buildings are within the scope of the work EeMAP is doing to establish an EEM, but the initiative's central focus is how we create the biggest impact on Europe's climate goals by driving renovation across the residential building stock.

See: <http://energyefficientmortgages.eu/>

1.1 BRIDGING THE DIVIDE BETWEEN ENERGY EFFICIENT BUILDINGS, VALUATION AND FINANCE

Context

Banks can play a game changing role in providing long-term financing for energy improvements to the European building stock. They intervene at the most critical moment, when a property is built or bought and therefore have a unique opportunity to support the improvement of the quality and energy performance of buildings, both new and existing, whilst at the same time helping to potentially free-up disposable income through lower energy bills, enhance property value and, as a result, reduce credit risk for borrowers, lenders and investors.

As the EeMAP Report providing a review of the state of play of building performance indicators (one of a series of four) describes, the building and construction sector has come a long way in its understanding of what constitutes an energy efficient and environmentally sustainable building and the value this delivers for owners and occupiers, and a wide-range of tools and assessment frameworks exist to evaluate building performance. However, in many cases, the energy and environmental performance of buildings are not accounted for in credit risk assessments, signalling a disconnect between the buildings and financial sectors in this respect. This is especially true of the residential housing market, where mortgage affordability and valuation practices largely ignore these important issues.

On the funding side of the mortgage business, impressive progress is being made in bond markets with considerable increases in green – covered – bond issuance, however the scale needed to play a significant role in the transition to a low-carbon economy has yet to be reached.

Scope & objectives of this Report

The focus of the EeMAP Initiative is on energy efficiency in a first instance, however, it is anticipated that the framework developed to support the energy efficient mortgage will be and should be extendable to cover other measurable green/sustainable features of buildings e.g. water efficiency, where cost savings can be made and measured.

In this context, the present analysis seeks to analyse and draw best practice from green or sustainable finance more generally for the purposes of designing and delivering an energy efficient mortgage. This Report therefore describes the current knowledge of and best practice in green finance, with an emphasis on energy efficiency where possible, on both the origination and funding sides of the business. It describes past and current examples of green finance, offers an insight into the most common bottlenecks hindering the further development of the market and presents tentative conclusions which could help to direct the design and development of an energy efficient mortgage. We argue that while the market for green finance is fragmented and heterogeneous at present, key trends have begun to emerge in the market in relation to market activity which can help to pave the way forward.

CURRENT STATE OF PLAY OF GREEN FINANCE

In order to be able to build a complete and comprehensive picture of the current state of play of green finance, in particular green mortgage finance, wide-ranging market research and stakeholder interviews combined with an emerging analysis survey³ analysis covering 14 EU Member States and three international case studies. The results of this extensive research are presented in the specific topic chapters below, which seek to identify current state play, bottlenecks, barriers and best market practices in order to identify recommendations on the basis of which the EeMAP Initiative can move forward.

2. MORTGAGE ORIGINATION & GREEN BUILDINGS

The volume of outstanding mortgage loans in the EU amounted to EUR 7 trillion at the end of 2016, representing 30% of total assets in the EU banking sector (€23.6 trillion in 2016) and equalling 47% of EU GDP. With these figures and banks' role in financing the purchase or renovation of buildings in mind, the mortgage industry has the potential to play a game-changing role in relation to the EU's energy savings targets. Fundamental to the success of the EeMAP Initiative therefore is a clear understanding of the current state of play of green mortgages and the potential for development in order to identify best practices in relation to product and process/system design, data collection and analysis, marketing and communication etc., to underpin a future energy efficient mortgage.

2.1 EXPERIENCE OF GREEN MORTGAGES & MOTIVATION

Of the financial institutions interviewed for the purposes of this report, two-thirds have experience of some kind with green mortgages or green loans. Some financial institutions report that green financing products in general represent a growing share of their portfolio, and two financial institutions who have yet to originate in this area indicate that green finance is on their agendas, with one planning to offer green loans in 2017.

In terms of motivation, financial institutions active in the market as well as those which have not yet engaged in this area, indicate many of the similar reasons for originating green mortgages or planning to do so in the future. These can be broadly grouped into three areas:

- **Commercial:**
 - Origination: Development of local network; offering of innovative and competitive products to support consumer needs and strengthen client relationships
 - Funding: Diversification of investor base and added value to investors

- **Regulation driven:** Improved credit and asset quality, as a response to government support
- **Corporate Social Responsibility:** Part of a sustainable strategy to reinforce social responsibility, and promote energy savings

For those financial institutions which have not yet entered the green finance market, several barriers to doing so have been identified which can broadly be categorised as follows:

- **Low interest:** Green mortgages are not a local priority; there is no public discourse; there are no incentives, more understanding is required.
- **Operational considerations:** IT systems do not allow for green filtering or tagging; the legal framework is not conducive to green finance – in some countries, the law only allows issuers to have one cover pool. This means that financial institutions are unable to build a pure, green cover pool, enabling them to issue a 100% green bond. In this context, financial institutions might mix their cover pool with green mortgage loans, however such a pool will not help to take advantage of green mortgages in terms of lower funding cost/cheaper mortgage covered bond funding.
- **Technical considerations:** Difficulties in translating energy efficiency into green value.

Interestingly, a quarter of financial institutions interviewed report having at one time been active in the green finance market but indicate that they have since closed their green product lines, for example due to government subsidies making the products unattractive or as a result of low take-up.

In this context, in Belgium, for example, the government provided subsidies for the installation of solar panels/insulation etc. However, when the subsidy scheme was withdrawn, the green mortgage products and green consumer credit products offered by Belgian banks to support the financing of these renovations were no longer attractive for clients.

When those financial institutions with no prior experience of green mortgages were asked to provide input on what they would consider as essential in a definition of a green mortgage and a lending guide, several similar points were highlighted relevant to both:

- **Standardised procedures;**
- **A reference to widely-accepted labels for energy efficiency in Europe** and clear guidance on what energy category would qualify for preferential financial conditions linked to the mortgage – in this respect a specific harmonised scale across Europe for green mortgages based on the energy efficiency of the underlying property would be important;
- **A consistent framework to set the baseline** and review the energy efficiency of a property on an ongoing basis;
- **Clarity in the financing and repayment mechanism,** including any lender or market limits;

3 — The survey was conducted with financial institutions and other closely related stakeholders on the current state of play of green finance in the EU. Of the 53 responses received, 30 (26 of which were received from financial institutions – large universal banks, specialised mortgage banks, cooperative banks and building societies) were deemed eligible and constitute the basis of this analysis.



- Guidance and support on appropriate data collection and reporting;
- Evidence of tangible benefits for the borrower along with clearly indications of associated conditions;
- Guidance on tax breaks and subsidies;
- Incentives for market participants e.g. different prudential treatment in terms of a lower risk weight for energy efficient mortgages when properly justified from a credit risk perspective.

The first three bullet points indicate demand from financial institutions for a harmonised energy efficiency measurement system. However, as the EeMAP Report on Building Performance Indicators indicates, the introduction of a harmonised system across the EU will be difficult to achieve due to differences in Member States approaches to measurement. Nonetheless, the same report also suggests that a system of comparable processes/frameworks – allowing for the integration of national standards and approaches – could be a feasible and successful alternative.

2.2 ORIGINATING GREEN MORTGAGES

The results of the survey indicate that there are different green finance products available in the market, including e.g. consumer loans for renovation and mortgage loans. As far as green mortgage loans are concerned, these cover residential, commercial and retail real estate and typically both new build and existing properties, although a minority of financial institutions report that they only finance existing properties for the purposes of renovation. Key features of green mortgages, which distinguish them from conventional mortgages, include preferential interest rates, rebates and/or tax advantages. The vast majority of those financial institutions active in this market do not deploy a specialised origination procedure i.e. higher debt to income or loan to value ratios.

The way in which existing green mortgages are defined varies according to the financial institution in question. In some cases, specific requirements have to be fulfilled. For example, these requirements might be energy consumption related or they might be based on energy performance certificates (EPCs) where eligibility is limited to energy levels above B (and in some cases A), or both. When investigating the reasoning behind these thresholds, early feedback suggests these levels are driven – although not exclusively – by feedback from investors and stakeholders and energy efficiency requirements in legislation. In other cases, a mortgage may be defined as green simply on the basis of tax advantages or government subsidies linked to the loan, separate therefore from the energy rating of the property on the conclusion of the renovation works. In one case, the product is originated on the basis of a list of acceptable home improvements which act to reduce energy consumption. It is the act of improving the energy rating which defines the mortgage loan as green, even though the overall energy rating may still be low.

2.3 MARKET RESEARCH & COMMUNICATION

In terms of target audience and borrower characteristics, it is reported that middle class borrowers and the younger generation are typically more interested in green residential mortgages than other categories of borrowers⁴. As far as commercial mortgages are concerned, more frequent uptake is reported amongst professional investors and publicly listed companies, as well as farmers. It appears widely to be the case however that few potential borrowers, particularly in the residential mortgage market, proactively express an interest in or seek out green finance⁵. There are potentially many reasons for this, which will be explored by way of consumer research during the course of the Project, however, one explanation could relate to a lack of awareness around green finance opportunities. In this respect, market research undertaken for the purpose of this Report indicates that a number

4, 5 — EeMAP Emerging Analysis, p 14.

of financial institutions have an active communication strategy in this area. This being said, many expressed an interest in developing one, although for some this was contingent on the market evolving favourably in the future.

3. RISK MANAGEMENT, DATA & VALUATION

3.1 RISK MANAGEMENT

Central to financial stability and systemic risk mitigation are appropriate risk management and control functions of a financial institution. These in turn are vital for efficient and effective capital measurement and planning with a view to determining a financial institution's capital requirements. Financial institutions with more advanced risk management capabilities are able to develop and employ internal risk management and planning models to identify and assess all material risks affecting the institution, including credit risk, in order to reach a conclusion on their capital adequacy status and therefore plan accordingly.

While research on the correlation between energy efficiency and probability of default has not yet been undertaken using standardised EU datasets, as the EeMAP Report on this topic explains, there are studies⁶ using US data which have shown that energy efficiency positively impacts probability of default, property value and prepayment speed, all of which are important risk parameters for financial institutions. It is therefore relevant to understand to what extent energy efficiency/sustainability criteria are – or could be – integrated in risk management processes for the assessment of credit risk.

Of the financial institutions interviewed, only one indicates that energy efficiency/sustainability criteria are included in their credit risk assessment processes for the purposes of determining capital requirements and this is only the case for corporate counterparties, not for private individuals and mortgages. For corporate counterparties, such criteria are taken into account in both the override process⁷ and in the qualitative questionnaire which is part of the internal model. In terms of the latter, environmental considerations are combined with other quantitative considerations, with different weights attributed, in order to calculate the counterparty's probability of default (PD).

Looking at measures of risk for financial institutions, only one of those interviewed reports that the debt to income (DTI) ratios of all new, green borrowers are recorded at the time of origination. As far as PD and loss given default (LGD)⁸ are concerned, a very small number of financial institutions indicate that they would be able to record the PD and LGD for green mortgages, but that at the current time this information is not registered. All other respondents note that currently there is no differentiation made in their

risk management processes between green and conventional mortgages, although almost all of them suggest that if this differentiation were to be made, recording this data would be possible. Interestingly in this respect, European DataWarehouse (ED)⁹ provides the possibility of recording DTI information by way of an optional field in the ECB RMBS loan-level data templates. This is significant as the European Central Bank (ECB) data templates are applicable for European residential mortgage-backed securities (RMBS) transactions, thereby ensuring the collection of standardised data.

A similar picture emerges with regard to whether or not increases in property value and differences in prepayment rates¹⁰ in relation to green mortgages are captured in risk management processes. A very small number of financial institutions indicate that it is possible to record prepayment rates, although no analysis of potential differences compared to the prepayment speed of conventional mortgages has been conducted. The vast majority of financial institutions interviewed therefore indicate that risk management processes do not allow for such information to be recorded. Once again, the lack of differentiation made in risk management processes between green and conventional mortgages is relevant here, although, as above, almost all of these financial institutions suggest that if this differentiation were to be made, recording this data would be possible. European DataWarehouse for its part indicates that data users can derive this information using ED loan level data, with the ECB RMBS template having a mandatory reporting requirement of the prepayment rate of the underlying residential mortgage loans. While no analysis has been undertaken at present, data could potentially be extracted by jurisdiction and year depending on the transaction being defined as green. For further information on the green securities, please see the Obvion case study on Chapter 5.

Turning to more strategic considerations, only two financial institutions confirm that they actively promote energy efficiency/sustainable renovation of mortgage collateral (mortgaged property) as a way of reducing risk in their mortgage portfolio. Of those respondents which do not promote such renovation one does however signal agreement with the risk reduction premise but highlights concerns about the potential for abuse/gaming of the system.

3.2 DATA

Closely linked to the question of whether risk management processes take account of risk parameters specific to green mortgages is the question of whether existing loan data allows for the impact of energy efficiency/sustainability on risk to be measured. In light of the analysis provided under 2.2.1, it logically follows that the loan data of very few financial institutions interviewed, in fact in most cases only one, would allow for a comparison

6 — Studies include:

- Brounen, D. and Nils Kok (2011): "On the economics of energy labels in the housing market", *Journal of Environmental Economics and Management* 62, p. 166-179;
- Kok, N. and Kahn, M. E. (2012): "The Value of Green Labels in the California Housing Market", WP UCLA Institute of the Environment and Sustainability (available [here](#)).
- Hyland, M., R.C. Lyons., S. Lyons (2013): "The value of domestic building energy efficiency – evidence from Ireland", *Energy Economics* 40, p. 943-952;
- SBI (2013): "Sammenhæng mellem energimærkning og salgspris", Statens Byggeforskningsinstitut in corporation with University of Aalborg, 2013(06);
- Fuerst, F., P. McAllister, A. Nanda, P. Wyatt (2015): "Does energy efficiency matter to home-buyers? An investigation of EPC ratings and transaction prices in England", *Energy Economics* 48, p. 145-156;
- Copenhagen Economics (2015) (available [here](#));
- CRIF (2016) (available [here](#));
- Institute for Market Transformation (IMT)/Center for Community Capital at the University of North Carolina (2013): "Home Energy Efficiency and Mortgage Risks" (available [here](#)).

7 — The override process allows for a correction (an upgrade/downgrade) of the counterparty rating if elements that are not taken into account in the model are deemed to impact the rating.

8 — Loss Given Default (LGD) is a common parameter in risk models and determined by the Capital Requirement Regulation (CRR). LGD is the credit loss incurred by a bank if an obligor defaults, presented as a percentage of the total exposure to loan which the obligor defaulted on. At loan level, the LGD calculation is easily understood with the help of an example: If the client defaults with an outstanding debt of €200,000 and the bank or insurance is able to sell the security (e.g. an apartment) for a net price of €160,000 (including costs related to the repurchase), then the LGD is 20% (=€40,000 / €200,000).

9 — The European DataWarehouse (ED) is the first central data warehouse in Europe for collecting, validating and making available for download detailed, standardised and asset class specific loan level data (LLD) for Asset-Backed Securities (ABS) transactions.

10 — Prepayment of a mortgage (i.e. repayment before the term of the mortgage) can be seen as a risk for a financial institution as the expected stream of payment and return are not realised, potentially resulting in losses.

of LGD and increased asset value and a correlation to be drawn between PD, LGD and the energy rating of the property in question. However, as indicated above, it is generally agreed that if a differentiation were clearly made between green and conventional mortgages, it would be possible to collect relevant data and then analyse it.

A separate EeMAP reviews the existing literature and research on the correlation between energy efficiency and probability of default, however, for the sake of completeness here and as indicated above, research carried out in the US by the Institute for Market Transformation and the **University of North Carolina Center for Community Capital¹¹** suggests that **borrowers financing energy efficient properties have a 32% lower probability of default on their loan**. This is because the energy costs, which can represent a large share of borrowers' monthly housing costs, are lower. Interestingly and also relevant to the EeMAP Initiative, this same research suggests that **energy efficient borrowers are 25% less likely to repay their mortgage early**.

As a general observation, while different lines of thinking exist on whether green features impact a product's risk profile, and whether there is a case for reviewing the current capital requirements framework, the current lack of a standardised dataset for such products will be crucial in order for the case to be made for a realignment of capital requirements.

3.3 PROPERTY VALUATION

As indicated above, a number of studies in the EU and beyond and in individual Member States suggest that **improving the energy efficiency of a property has a positive impact on property value**, although this differs from region/country to region/country. An insight into green value is provided in the EeMAP Report

on Mortgage Lending Valuation. **The potentially positive impact on value is relevant in a risk management context**, making property valuation processes and the way in which they account for energy efficiency/sustainability – if at all – of crucial importance for a future energy efficient mortgage. **Property valuation is critical for risk management and the facilitation of better information of energy efficiency features should be encouraged between financial institutions and the valuation profession in order to boost data availability in order to properly assess the value of energy efficient buildings.**

The above mentioned EeMAP Report also focuses on the current state of play and costs/bottlenecks in the definition of green value and considers the issue of green value in more detail, however, for the purposes of this Report given the importance of value in the context of loan to value ratios and LGD in terms of risk, it is interesting to note that of the financial institutions interviewed, a third indicate that energy parameters, such as the EPC, may under certain circumstances be taken into account in the valuation of property for lending purposes: (i) if the information is available, (ii) if energy parameters are considered to have an impact on the value and (iii) if sufficient data is available the data of the property to be valued is compared against data on energy efficient buildings. Based on a weighting of all components of recoverable operating costs or non-recoverable operating costs, the rent for sustainable aspects of a less efficient building is reduced if applicable.

Half of respondents however indicate that energy parameters are not taken into account in the valuation. Interestingly, only a relatively small number of financial institutions specifically instruct valuers to report on energy efficiency in their valuation reports. The majority do not; however, of these, a very small number are currently discussing the possibility of requiring this information as part of efforts to improve value reporting.



11 — Institute for Market Transformation (IMT)/ University of North Carolina Center for Community Capital (2013): "Home Energy Efficiency and Mortgage Risks" (available [here](#)).

While this underlines the early stages of the transition of the a more sustainable financial system in terms of energy parameters in the context of the valuation of property, a number of the financial institutions interviewed express the opinion that **low energy consumption/demand is increasingly impacting positively on the market value of properties**. There is also a widespread sense that the **importance of energy efficiency is growing amongst consumers**, which is likely to drive further increases in values. Particularly in the case of commercial property, it is reported that energy performance can have a significant impact on value in areas with high vacancy rates and low prices.

Other financial institutions nevertheless report a different experience, indicating that energy efficiency has limited impact, with location, for example, being a main driver of value. This aligns somewhat with findings in the “Beyond Energy” section of the EeMAP Report on Building Performance Indicators, which notes that sustainable building assessment best practice also looks at using data on factors such as location to assess the likely environmental impact of transport to/from the property, and things such as **‘resilience’ in earthquake or flooding prone areas and health and wellbeing aspects** such as thermal comfort or daylighting. These **building performance aspects are thought to more closely link sustainability with value**. Financial institutions also make the point that the sustainability of energy efficiency measures over the lifetime of the loan, as well as the maintenance of the property and the way in which materials are disposed of through the property lifecycle, are crucial in order to be able to factor such parameters into the value. **An overarching point made by some financial institutions is that limited market transparency and evidence makes impact difficult to identify and assess;** they underline the urgent need for energy efficiency metrics and data.

4. ENERGY EFFICIENCY MEASUREMENT & INTERNAL PROCEDURES

A central question in the design and delivery of an energy efficient mortgage is how to implement energy efficiency considerations into banks’ standard lending practices **so that energy efficiency can be factored in to affordability assessments**. The EeMAP Report on Building Performance Indicators will be crucial in understanding and determining appropriate indicators for the purposes of this product, however, in the meantime it is useful to understand current practices in banks in this respect and, where possible, highlight areas of best practice regarding measurement of energy efficiency at origination of the mortgage and, in the case of the energy efficient renovation of an existing building, the improvement in the energy efficiency which would justify the preferential financing conditions of the energy efficient mortgage as per the EeMAP Initiative’s financing mechanism.

Of those financial institutions interviewed for the purpose of this Report, **only a handful report that they specifically collect energy-related data for the purposes of originating a ‘green mortgage’**. The **majority indicate that they do not collect such data**, however, in a small number of these cases, an average or worst case scenario in terms of energy performance is taken account of in regular lending practices, by e.g. modelling energy cost on national averages using national statistics family spending reports. As highlighted in the EeMAP Report on Mortgage Lending Valuation properties which are below average in their energy efficiency may suffer real value erosion as the market and government policy starts to recognise the need for efficient buildings. One institution details that the energy performance of each specific property is considered within the valuation of that property and its risk profile, adding that **properties with low energy performance will be treated with a higher risk profile**, which also affects lending.

Case Study: Lenders Project

The Lenders Project explores the extent to which mortgage lenders can better estimate energy in order to better reflect household energy costs into mortgage applications. The Project, which was launched in 2015, investigates whether these more accurate predictions of future fuel bills can be utilised at different points in the mortgage process, and assesses whether fuel expenditure can impact affordability calculators by examining the link between property energy efficiency and fuel bills.

The project has found that the monthly savings from fuel bills in a higher rated home (equivalent to two EPC bands), could equate to around £4,000 in additional mortgage finance. These findings stress the benefits of owning an energy efficient property by highlighting the potential savings homebuyers could archive on their fuel bills and the impact which an increase in disposal income could have on their borrowing capacity by incorporating energy performance linked fuel costs as a factor in the mortgage affordability calculations.

As part of the Project, a fuel bill calculator has been developed and made freely available to homebuyers, lenders and related parties for use as advice alongside the mortgage sales process, acting as a ‘nudge’ to consumers.

When investigating what energy-related data financial institutions require for the purposes of ‘green’ mortgage origination (i.e. predicted energy consumption, actual energy consumption and the format and from which source), those **financial institutions collecting such data typically require both energy consumption- and energy demand-related information**, which must be verified by an expert or architect. One financial institution requires only energy consumption-related data, which is based on the EPC.

Of the data collected, the relevant financial institutions indicate that some data is recorded in loan monitoring systems, typically primary energy demand and consumption data in kWh/m² either through building permit data for new builds and EPCs or other external certifications (e.g. BREEAM, DGNB, HQE, LEED etc.) for residential and commercial real estate. **Broader research¹² indicates that the EPC is widely recognised as the common denominator in respect of energy performance certification/data reporting.** With this in mind and with a view to facilitating the processing of energy data, it is worth mentioning in this context that the accessibility of the EPC in an electronic version was underlined by several financial institutions.

Significantly, almost half of financial institutions interviewed indicate that, although they do not collect energy-related data at the current time, their loan monitoring systems could be adapted to allow the recording of such data. Looking more closely at necessary IT system adjustments which would enable the recording of data on energy efficient mortgages, market feedback broadly indicates two categories, with a majority of financial institutions falling into the first of the two:

- **A number of financial institutions note that IT adjustments would be manageable and suggest that the main difficulty would remain in data collection to complete the data fields;**
- Some financial institutions on the other hand note that **IT adjustments would be both costly and difficult**, particularly if a bank is part of a broader group.

12 — Broader research is in this context understood as extensive research undertaken amongst the EMF-ECBC Membership and collaborator Stakeholders.

A large number of financial institutions interviewed, whether they collect energy related data or not, indicate that they have quality assurance processes in place, either internally or through external consultants, to ensure that only reliable and trustworthy data (of any kind) is entered into their loan monitoring systems¹³. Emphasis is also placed on continuous improvement of data to ensure ongoing reliability and consistency. For energy-related data specifically, one financial institution describes the following procedure: The valuation department analyses the energy efficiency of the financed building and documents the information in a report. This provides a first indication as to whether or not the financed building could qualify as a green building. Subsequently, the treasury department makes sure that the energy efficiency of the financed building as analysed by the valuation department matches the internal criteria. Finally, the treasury department double-checks whether or not the financed building qualifies as a green building according to internal eligibility criteria. In addition, an extra check is conducted to ensure no other reasons exist which may hinder the allocation of the mortgage to the green finance portfolio. After this decision process, the data is entered into the database.

While it logically follows from the analysis of the findings so far outlined above that **the majority of financial institutions interviewed do not assess the improvement in energy efficiency of a building which has been financed by a green mortgage**, a small number do, variously reporting the following:

- The premise of the mortgage product is that the minimum requirements regarding annual primary energy consumption are met.
- If during the financing period substantial building improvement in terms of energy efficiency is undertaken a new/updated valuation would be required. Updated EPCs would be accepted as evidence.
- Improvements are only monitored in the case of commercial buildings currently and this monitoring is based on an expert report or an official EPC calculation.

Finally, it is apparent from the research conducted that almost no financial institution links specified energy behaviour to a mortgage on an ongoing basis i.e. there is no mechanism according to which more funds are granted if the borrower's behaviour results in a further reduction of actual energy use, although one financial institution suggests that if debtors' performance could be visibly linked to energy efficiency, then this behaviour could be linked to the mortgage in a systematic way. **Only one institution reports that specified energy behaviour is linked to mortgages**, however, at the time of writing, this institution was unable to share details on processes as a result of confidential preparations for an imminent green bond issuance. This will be pursued at a later stage in the EeMAP Project because experience here would be useful to understand how to factor behaviour into the assessment process.

Responses received and feedback from other discussions indicate that the main challenge to integrating energy efficiency into credit risk assessments at origination/remortgaging and loan monitoring procedures relates to a lack of sufficiently harmonised criteria relating to energy efficiency measurement and a lack of available data. It has furthermore been reported that if the appropriate definitions and data preconditions were in place, from a systems perspective subsequent challenges would be technical in nature, rather than financial (only a small number of financial institutions signalled a concern here as described above).

5. GREEN FUNDING MARKET

Residential mortgages in the EU are funded through a combination of savings deposits (approximately 64%), covered bonds (approximately 25%) and other mortgage backed securities (approximately 11%). These very approximate EU averages mask a very heterogenous situation across Member States, where in some countries, mortgages are 100% covered bond funded, while in others the vast majority are funded through savings deposits, while again in others there is a broader mix of funding sources. In any case, whatever the breakdown, with approximately 40% of EU mortgages funded through European capital markets, in designing and delivering an energy efficient mortgage, the EeMAP Initiative will deliver a new asset class, which can be identified and earmarked for the purposes of green bond and green covered bond issuance and in this way create further synergies in the mortgage lending and funding value chain, potentially helping to further unlock the potential of bond markets in parallel to mortgage markets to support the EU's energy savings targets.

Over the past few years, green and sustainable bonds have been a fast-growing capital market segment. The first issuers of green bonds were supranational issuers such as EIB and IFC/World Bank. Since then a wide variety of corporate and agency issuers as well as local and regional authorities and sovereigns have entered the market. Banks also play an increasing role with green (covered) bond and senior unsecured issuance by a number of household names, which will be detailed below. Significantly, in recent months, the ECBC took the necessary steps to identify already existing 'substantial covered bonds' through the ECBC Covered Bond Label website, giving issuers the opportunity to tag their green issuances with a green leaf icon. In the coming months, the ECBC will be working actively with its issuer members to define and put in place a 'energy efficiency covered bond label', with a view to setting standards on the funding side in parallel to the EeMAP progress on the asset side.

With all of this in mind, it is therefore interesting to also map the state of play of the funding market from the perspective of both the issuer, including the role of rating agencies, and the investor with regards to green/ESG bonds and the rating of these instruments in order to assess the current state of play and draw best practice examples.

5.1 GREEN ISSUER PERSPECTIVE

Of those financial institutions interviewed for the purposes of this Report, seven noted they have specific experience with the issuing of green, ESG or climate change bonds, both covered and unsecured, in the last few years. Those financial institutions with green bond issuance experience report assets with a variety of different characteristics being included in pools, including: green, energy efficiency including thermal energy and renewables, water efficiency, environmental aspects and social aspects with a focus on the social rental market.

The majority of financial institutions interviewed report no previous experience with green bond issuances, **however a number of financial institutions indicate that they fund or envisage funding green mortgages using conventional funding instruments (as opposed to green bonds specifically).** Others point to the use of a combination of funding instruments. One financial institution noted that the choice of funding would depend on interest expressed by the market.

13 — Emerging Analysis p. 24 contains an overview of how different internal quality assurance are implemented within organisations.

Case Study: Green & ESG Covered Bonds

In the covered bond space, **Münchener Hypothekbank** was the first issuer of an Environmental, Social and Governance (ESG) covered bond back in September 2014. Münchener Hypothekbank uses the proceeds of its ESG Pfandbriefe to refinance loans to housing cooperatives in Germany. The funds are employed to purchase, build and improve the energy efficiency of housing and maintain housing for socially disadvantaged sections of society. However, it is important to note that ESG covered bond investors rank *pari passu* with other mortgage Pfandbrief investors and do not have a preferential claim on the ESG assets in the cover pool of the issuer. According to Münchener Hypothekbank, its inaugural ESG Pfandbrief attracted many new investors. About one third of the deal was allocated to new investors who only buy ESG bonds and who have not bought covered bonds from Munich Hyp in the primary market before.

In April 2015, **Berlin Hyp** followed with its inaugural green mortgage Pfandbrief. Berlin Hyp has so far issued two green Pfandbriefe, one in April 2015 and one in June 2016. In contrast to Munich Hyp's ESG Pfandbrief, the covered bonds are genuine green covered bonds and have benchmark size (EUR500m). The issuer stated in its press releases that the bonds attracted many new investors and that almost half of the deals were placed with sustainable investors. Berlin Hyp committed to use the proceeds of its green Pfandbrief for the financing of 'green buildings' in Germany, France, the UK, the Netherlands and Poland. These assets are included in Berlin Hyp's 'normal' mortgage Pfandbrief cover pool and the Green Pfandbrief – in line with the treatment of Munich Hyp's ESG Pfandbrief – will rank *pari passu* with the other mortgage Pfandbriefe of the issuers. In case of issuer insolvency, investors will have a claim against the entire cover pool without having a preferential claim on the green cover assets over and above other 'normal' mortgage Pfandbrief investors.

In Spain, two issuers have entered the sustainable market segment: **Kutxabank** in 2015 and **Caja Rural de Navarra** in 2016. Kutxabank issued its first Social Covered Bond to support low-income individuals and families to have access to adequate accommodation. The proceeds from the issues are therefore used for financing existing social housing loans and to finance new loans and new social housing projects. With its sustainable Cédula Hipotecaria, Caja Rural de Navarra committed to allocate the proceeds from the transaction to projects focused on creating a social impact in local communities and environmental sustainability. In the case of Kutxabank and Caja Rural de Navarra, the bondholders have the same claim against the cover pool as all the other Cédulas Hipotecarias investors, i.e. they do not have a preferential claim on these sustainable assets in the cover pool.

Of those financial institutions with no specific experience of green bond issuances, three quarters indicate that internal discussions regarding future green issuances have taken place. The following elements were reported as barriers to issuing these kinds of bonds at the current time:

- Lack of definition of 'green' to be applied across sectors and asset classes and therefore difficulties around identifying eligible loans;
- Insufficient (quality) data and transparency to ensure integrity of the asset class;
- Increased costs related to setting up of framework but lack of pricing/cost advantage in the bond;
- Legal restrictions e.g. only one cover pool can exist under the current law;
- Limited evidence of investor appetite for green covered bonds;

- Concerns about the creation of two 'classes' of covered bonds, giving investors the impression that one is more secure or of a better quality, to the detriment of the other.

The latter concern expressed suggests that clear communication would be required to distinctly separate some key issues – financial performance of the investment is one thing – **its underlying green performance is another.** Whilst the hope is that there is a strong link, it is true (a) some very brown investments perform well as things stand (b) some very 'green' investments are not financially profitable. There is not a simple direct correlation. The obvious ultimate outcome is finding investments that are both green and perform well financially. Two of the seven financial institutions interviewed

Case Study: Green Senior Unsecured Issuances & Green RMBS

In May 2016, **ABN AMRO** issued its second 'Euro green bond', a senior unsecured green bond that has been certified by Oekom and Climate Bond Initiative. The bond enables ABN AMRO to finance mortgages of recently built highly energy-efficient homes, loans for solar panels and/or energy improvement measures for existing homes and sustainable commercial property. New assets added to this second green bond include energy-efficient renovations and transformations to existing commercial property. The EUR 500 million bond has a maturity of 6 years and was issued at midswaps + 52 basis points.

In June 2016, **Obvion** issued the first green residential mortgage backed securitisation (RMBS) globally, the so-called Green Storm consisting of a EUR 500 million RMBS. Obvion will use the proceeds of the RMBS to refinance its mortgage loans for energy efficient Dutch residential buildings. The order book was over EUR 1.2 billion and investors without green investment policies were asked to wait and invest in other issuances. The green RMBS were compliant with the ICMA Green Bond Principles 2015. Following the heavy investor defamed for RMBS debut deal, Obvion issued a second green RMBS in May 2017, which will only securitize assets that comply with the green eligibility criteria related residential properties having certain energy performance certificates. The proceeds of the Green Storm 2017 will be used to refinance existing mortgage loans from Dutch residential buildings that represent the top 15% in terms of energy performance in the Netherlands, or which have achieved at least a 30% improvement in energy efficiency.

In September 2016, **Berlin Hyp** issued its first senior unsecured green bond. Berlin Hyp uses the proceeds from the issue to refinance loans for green buildings. The applicable criteria for classification as a green building are predominantly based on the energy efficiency of a commercial property, but also include other sustainability criteria. As with the Green Pfandbrief, the bank is also striving to invest an amount equivalent to the proceeds from the issue in additional new green building financing for the term of the bond. The positive ecological and sustainability performance of the Berlin Hyp green bond programme, under which the bond was issued, was certified by oekom research in the form of a second-party opinion. The EUR 500 million bond has a term of seven years, offers a coupon of 0.5% and is rated A+ and A2 (positive) by Fitch and Moody's respectively. The re-offer spread was set at mid-swaps +52 basis points. The order book reached more than € 1.2 billion, meaning that the bond was oversubscribed by a factor of 2.4. One feature of particular note is that 41% of the bond went to sustainable investors. In addition, 35 investors invested in a Berlin Hyp bond for the first time.

Case Study: Berlin Hyp Green Pfandbrief Second Opinion from oekom Research

oekom's overall evaluation in August 2016 of the Green Bond Programme of Berlin Hyp AG was positive:

- The Programme's formal concept, defined processes and (announced) disclosures are aligned with the Green Bond Principles
- Berlin Hyp has clearly defined a concept for its Programme regarding use of proceeds, process for project evaluation and selection, management of proceeds and disclosure
- The overall sustainability quality of the selected assets for inclusion in the asset pool in terms of sustainability benefits and risk avoidance and minimisation is good
- The issuer itself shows a good sustainability performance

Recommendations to improve the overall quality of the Programme include:

- Raising the requirements for some external sustainability certificates, e.g. minimum green building certificate of BREEAM "Very Good" instead of BREEAM "Good".
- Complementing the existing energy efficiency requirements with minimum environmental requirements regarding site selection and construction."

In its April 2017 evaluation further to BerlinHyp's second green pfandbrief issuance, oekom highlights the fact that Berlin Hyp has given effect to the first recommendation above, by improving its requirements regarding Green Building labels and current requirements. For example, Berlin Hyp now requires LEED "Gold" instead of LEED "Silver".

with experience of green issuances indicate that their issuances were conducted according to an underlying internal, green/sustainability framework. Five of the seven report having externally assessed green/sustainable frameworks for the issuing of debt instruments, provided for example by oekom Research, a rating agency in the area of sustainable investment, external auditors e.g. KPMG and E&Y, or the Climate Bond Initiative on the basis of their real estate criteria. In line with the findings above regarding market experience, these financial institutions remain a minority with most respondents indicating that they do not have an externally assessed framework in this area, reflecting their inactivity at the current time in this market.

Turning to rating agencies/consultancies with a focus on green/sustainable investments, the financial institutions interviewed indicate knowledge of or experience with the following providers: oekom Research, MSCI EG, Vigeo, South Pole Group and yourSRI, which variously offer sustainability, climate and energy efficiency assessments. Oekom Research and Sustainalytics are also known as Second Opinion Providers. The Berlin Hyp case study below provides an example of a second opinion received, in this case of their Green Bond Framework under which two green pfandbrief have been issued to date.

In terms of spreads, feedback from a majority of financial institutions interviewed for this Report, as well as other research¹⁴, indicate that the market does not really distinguish between green/sustainable bonds and conventional covered bonds, despite the larger investor base of the former (as they attract sustainable investors in addition to their traditional investors). This being said, more than a handful of financial institutions report having

observed a difference, although this is generally not material. One financial institution reports a trend towards lower cost of funding from sustainable issues compared to regular ones.

According to analysts from HSBC, "the lack of differentiation is driven by two main factors. Firstly, from a risk perspective the cover assets backing the green or sustainable covered bonds are the same backing the other 'normal' mortgage covered bonds, i.e. in case of issuer insolvency green/sustainable covered bond investor do not have any preferential claim on the green/sustainable assets. Secondly, the green and sustainable (covered) bond market is still in its infancy and the investor base is still not large enough to justify a significant difference in the pricing".

Despite the lack of differentiation in spreads, a number of financial institutions interviewed indicate that green funding instruments are attracting new investors to the table. In some cases, financial institutions report that green products are attracting 'many' new investors in terms of volume

Case study: Pricing differentials in green vs. conventional bonds

The yield (the income return on an investment) at issuance of Münchener Hypothekenbank's ESG Pfandbrief and Berlin Hyp's green covered bond was not substantially higher than those of a 'normal' Pfandbrief. Also, today, their green deals trade more or less in line with the other German mortgage Pfandbriefe, as shown by the current spread levels (see figure 1). Spread levels ("Spreads vs Swaps" in the charts) are a measure of trading price. The same holds true for the sustainable deals by Kutxabank and Caja Rural de Navarra (see figure 2).

Figure 1: German Pfandbrief Market

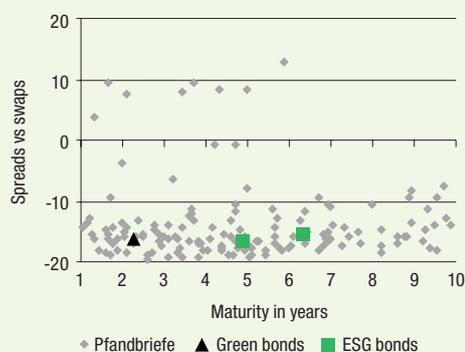
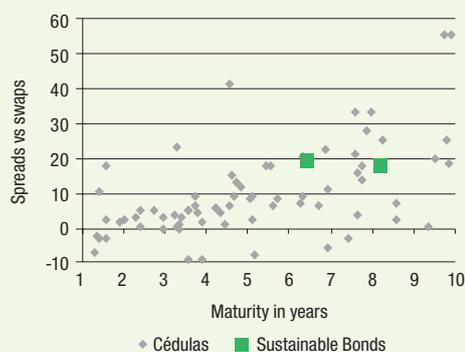


Figure 2: Spanish Covered Bonds Market



14 — 2017 ECBC Fact Book available here: <https://hypo.org/ecbc/publications/fact-book/>

and numbers, while others additionally point to an increasingly diversified set of investors aware of reputational factors. Still, a majority of financial institutions interviewed indicate that at the current time they have not observed an increase in investor appetite, although typically these respondents are those who have yet to specifically issue green bonds. As illustrated throughout this Report, despite the current yield and spreads levels, green debt securities continue to be issued, and according to Global Sustainable Investment Alliance¹⁵, total assets worth USD 12.04 trillion were invested using a sustainable and responsible strategy in Europe alone by end of 2016, which represents a 12% increase from 2014.

Financial institutions with green bond issuance experience also report that investors have certain requirements in relation to the underlying green assets, for example in terms of transparency relating to criteria, allocation and definition of what is green. Indeed, a growing number of investors – not only sustainable investors – are setting out distinct criteria under which to invest. One of the most common form of investing is negative/exclusionary screening, i.e. investors define categories in which they do not invest (weapons, gambling, alcohol). Investors are also starting to integrate ESG criteria into their investment decisions. In general, it is noted that investors require state-of-the-art impact reporting and transparency on how the environmental impact is measured and knowledge about the environmental and/or climate relevance of the project categories when investing in green debt securities. The credibility and consistency of the external review and the annual reporting on use and management of proceeds are also considered important. In terms of sectors, energy efficiency was highlighted as being by far the most important based on investor interest, particularly with regard to the eligible mortgage assets.

With green/ESG pioneers such as ABN AMRO, Münchener Hypothekbank, Berlin Hyp, Kutxabank and Caja Rural de Navarra and others, there is reason to believe that there is significant market potential for the green and sustainable bond market. A number of financial institutions interviewed anticipate robust investor demand for energy efficient mortgage-backed securities going forward based on the following: i) the positive response already been received for green bonds related to energy efficient real estate; ii) the fact that the demand for 'green' investment possibilities continues to proportionally outpace the supply and iii) the growing number of SRI/ESG funds which will drive demand even further. With that being said, other financial institutions are more cautious in their predictions, pointing to the current low interest rate environment and the ECB asset purchase programmes as limiting factors at the current time in relation to investor demand. It is also reported by issuers that the lack of a common language within the market, as well as a very heterogenous approach to sustainability are a source of uncertainty for investors. Indeed, the longstanding issue of a general language may hopefully be facilitated by DG Environment's recently published EU sustainability framework of indicators for office and residential buildings¹⁶. Another interesting comment from this group is that material new interest is not anticipated from investors, rather it is expected that existing investor interest will be recycled into green and sustainable bonds.

5.2 GREEN INVESTOR PERSPECTIVE

As far as the perspective of investors themselves are concerned, a number of financial institutions interviewed report that they have an interest in green investment driven variously by: client demand; growing awareness of social responsibility and role in the community; increasing organisational focus



on energy policy concerning branches, headquarters and assets, and subsequent sustainable ambitions; pricing; lower PD; credit quality; regulation and customer behaviour. Of those financial institutions who furthermore report having actual experience with green investment, some note that the proportion of these investments in their portfolio is very low, while others anticipate to increase their share and continue their sustainable investment strategy going forward.

Nevertheless, the majority of financial institutions interviewed for the purpose of this Report do not have experience with green investment and a similar number report no interest at the current time in green investments, although some of these financial institutions do report that current political and market-driven developments could make a case for entering the market.

For those financial institutions which are actively investing in green bonds, divergent strategies can be observed internally, with the criteria relating to the green investment strategies differing from one institution to another.

15 — http://www.gsi-alliance.org/wp-content/uploads/2017/03/GSIR_Review2016.F.pdf

16 — The common EU framework of core sustainability indicators for office and residential buildings (level (s)) is available here: http://ec.europa.eu/environment/eussd/pdf/170816_Levels_EU_framework_of_building_indicators_Parts.pdf

The following elements give an indication of the different criteria which were reported by investors:

- Key market segments are energy efficiency and renewables, climate change and greenhouse gases and social projects
- Pricing and credit quality also play an important role
- Impact reporting is crucial – some financial institutions report internal criteria to evaluate, for example, the sustainability or environmental performance of companies, the presence of a specific environmental policy, the percentage of renewable energy, plans for reducing emissions, responsible use of water in the process and the development of eco-friendly products
- Companies involved in severe offences against International Conventions on environmental issues are excluded from investments, as are oil producers and suppliers, mining companies and tobacco and firearms manufacturers.
- Sustainability indicators may be based on data from external companies, such as Sustainalytics which specialises in ESG and corporate governance research and analysis.

A small number of financial institutions report no specific green criteria at present but a readiness nevertheless to adopt such a strategy if this were to be decided at group level.

6. TRANSPARENCY & MARKET INITIATIVES

Market initiatives can play a significant role in implementing, on the one hand, market due diligence and, on the other, in pricing an energy efficiency factor into market best practices from the origination of the mortgage until the funding of that mortgage on capital markets.

Looking at the positive experience of the European Covered Bond Council's (ECBC) Covered Bond Label we believe that in similar terms an energy efficiency covered bond label would play an important role in standardising definitions and criteria, increasing transparency and promoting investor confidence and therefore appetite.

A recent noteworthy development in this respect is the adoption by the ECBC of the following sustainable covered bond definition on its Covered Bond Label website: "A Covered Bond Labelled sustainable covered bond is a covered

bond that is fully compliant with the Covered Bond Label Convention, and also includes a formal commitment by the issuer to use an amount equivalent to the proceeds of that same covered bond to (re)finance loans in clearly defined environmental (green), social or a combination of environmental and social (sustainable) criteria. Covered Bond Labelled sustainable covered bond programs are based on their issuer's sustainable bond framework which has been verified by an independent external assessment. The issuer strives, on a best efforts basis, to replace eligible assets that have matured or are redeemed before the maturity of the bond by other eligible assets". Importantly, linked to this definition, is a 'green leaf' icon which allows issuers to 'tag' sustainable covered bonds (see below).

This market initiative to develop a definition and enable issuers to 'tag' their sustainable issuances is intended to deliver a benchmark which can be established in Europe by introducing an energy efficiency covered bond convention to be reviewed on a yearly basis by an energy efficiency committee (gathering the major European lenders and/or their representatives) and an advisory council (gathering European (and global) authorities and investors). This will provide the covered bond industry with the possibility of reviewing the qualitative parameters and updating the as appropriate, ensuring market consensus and delivering two crucial outputs: the best qualitative standards and the largest critical mass at European level.

7. INSTITUTIONAL & INTERNATIONAL PERSPECTIVE

The information provided in Chapter 2 provides a unique picture of the state of play of green finance in Europe based on feedback from market participants themselves. This section will add to this by providing an international dimension in order to place the findings described above in a broader, global context.

United States (US): lessons can be drawn on from the US, where energy efficient renovation and finance effort can be tracked back three decades. However, US lenders and appraisers have been slow to recognise the value of energy efficient homes. This is beginning to change. The US Appraisal Institute, the Appraisal Foundation and the US Department of Energy have undertaken work to help assure that uniform standards of US Professional

Sustainable Covered Bond No Yes All

Search ▶

ISIN	Issuer	Initial Date of Issuance	Maturity Date	Face value ¹	Coupon	Syn.	Listed	Tapped	Mat. ²	EEA ³	LCR ⁴
 XS1692489583	SR-Boligkreditt	03/10/2017	03/10/2024	EUR 500,000,000	Fixed	No	Yes	No	SB	Yes	1
 ES0415306051	Caja Rural de Navarra, Cr...	01/12/2016	01/12/2023	EUR 500,000,000	Fixed	Yes	Yes	No	HB	Yes	1
 ES0443307063	Kutxabank S.A.	22/09/2015	22/09/2025	EUR1,000,000,000	Fixed	Yes	Yes	No	HB	Yes	2A

1 - 3 of 3 First | < Previous | Next > | Last

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 Sustainable covered bond. A Covered Bond Labelled sustainable covered bond is a covered bond that is fully compliant with the Covered Bond Label Convention, and also includes a formal commitment by the issuer to use an amount equivalent to the proceeds of that same covered bond to (re)finance loans in clearly defined environmental (green), social or a combination of environmental and social (sustainable) criteria. Covered Bond Labelled sustainable covered bond programs are based on their issuer's sustainable bond framework which has been verified by an independent external assessment. The issuer strives, on a best efforts basis, to replace eligible assets that have matured or are redeemed before the maturity of the bond by other eligible assets. [Against this background, please note that the EMF-ECBC is currently working on market initiatives which will ultimately define European criteria for energy efficiency covered bonds and sustainability standards]

Appraisal Practice are applicable for energy performance and green valuations, and that appraisers are trained in the application of these standards.

Most US states have substantially revised their building codes to require ever-greater energy efficiency in recent years. Institutional examples of green finance in the US are Fannie Mae, Freddie Mac, FHA and the Veterans Administration (VA) which have all adopted special underwriting guidelines to take into account energy efficiency of homes for mortgage underwriting. In general, EE mortgages attribute more income to mortgage paying ability associated with lower projected energy costs of home ownership for the borrower. Some of these loans allowed for the financing of energy improvements at purchase, while others attributed alternative underwriting guidelines to homes with higher energy efficiency ratings. While states government have different energy policies, it is evident that the market see value in green financing solutions and tools to make energy property improvements. In respect to energy measurement practices, FHA (for homes with better than average Home Energy Scores), the home's Score is calculated by a home energy "Assessor", who inputs information about the home's characteristics into energy modelling software developed by the US Department of Energy and the Lawrence Berkeley National Laboratory. The Home Energy Scoring Tool software is designed to compare homes' performance, regardless of where they are located, or the number of occupants.

Canada: The Government of Canada launched a national campaign in 2016 to solicit input for the future of housing in Canada. One of the core principles of this campaign is a focus on promoting environmentally sustainable and resilient homes that contribute to Canada's climate change goals. In 2015, the federal government committed to reducing greenhouse gas emissions (GHG) by 30% below 2005 levels by 2030. This signals the federal government's recognition that housing has a large impact on the environment and that there is growing interest for housing options that contribute to a cleaner environment and housing affordability.

According to the 2015 Canadian Home Builders' Association Home Buyer Preference Study, 64% of homebuyers rated an overall energy efficient home as a 'must have' item, and an additional 25% considered it a 'really want' item. Given the government and housing industry emphasis on energy efficiency combined with an aging Canadian housing stock, as Canadians look to renovate their homes, many mortgage lenders may seek to capitalise on this demand, which in turn will influence the mortgage market offerings for financing home renovations.

As construction in Canada is regulated by the provinces and territories, there is no coordinated, national approach to energy efficiency standards in housing that currently exists. Because of this, Canadian jurisdictions have taken a variety of approaches to regulating greater energy efficiency in buildings, by either using their individual building codes, or applying legislation specifically addressing energy efficiency, or both. A particularly noteworthy trend in Canada is the rise in the development and deployment of a range of rating and labelling systems that characterise and communicate the environmental features and performance of housing and communities. These independent, third-party rating and labelling programs help consumers to make more informed choices about the environmental performance of the new homes they purchase, or the renovation of their existing homes.

At present, all mortgage insurers in Canada offer a program that offers partial purchase mortgage loan insurance (MLI) premium refunds to eligible borrowers if their home reaches a certain level of energy efficiency. In June 2016, the Canada Mortgage and Housing Corporation (CMHC) enhanced its Green Home Program to offer a MLI premium refund of either 15% or 25% to borrowers who either buy, build or renovate for energy efficiency using

CMHC-insured financing. Prior to this enhancement CMHC offered a 10% refund. CMHC's new premium refund structure recognises different levels of energy efficiency and provides a greater percentage of premium refund for homes achieving a higher level of energy efficiency. Therefore, the more energy efficient the home, the greater the potential premium refund for the homeowner. Within the Green Home Program, standard underwriting procedure is followed and the pricing of the MLI is the same. The premium refund is given to eligible homeowners after the full premium amount has been paid and the mortgage loan has been advanced. In order to be eligible for a premium refund, a homeowner must prove that their home has achieved a certain level of energy efficiency. While CMHC requires a one-time assessment of the home's energy efficiency, the documentation provided by the homeowner must not be older than 5 years in order to ensure that the Program continues to encourage above standard levels of energy efficiency. The primary method of verify the energy performance is through either an NRCan (Natural Resources Canada) rating or being enrolled in a labelling program. As in the US, Canadian jurisdictions have various energy programs however non-the less the market has like in many places in the word begin to developed on its own, which is a testimony of the trend that financial institutions have increased their focus on energy efficiency and sustainability in order to capitalise on growing consumer and investor demand in this area.

Japan: EE standards for buildings have been regulated in Japan since 1979, and EE mortgages is provided by the Japan Housing Finance Agency (JHF). The government has been providing incentives of tax reduction, subsidies and EE house points exchangeable for commodities and other incentives to promote energy efficiency of houses, including the subsidies to the EE mortgages provided by JHF. Furthermore, JHF have promoted the quality of the houses by providing incentives of additional loan amounts and interest rate reduction to the higher quality houses that satisfy the energy efficiency and other standards important to the government policy. Some key JHF energy efficiency mortgages products which are interesting for the Purpose of this Report are the following:

■ Flat35

Flat35 is the long term fixed rate mortgage (the interest rate is "flat" for 35 years) that is provided through the securitisation business, in which JHF purchases mortgages executed by private financial institutions and securitises them to MBS. There have been more than one million applications so far. One of the basic technical standards for Flat35 is "thermal insulation performance grade 2" equivalent. The grade 2 could save some 30% of heating and cooling energy in houses per annum compared to the grade 1 that conducts no energy efficiency measures, which doesn't satisfy Flat35 technical standards.

■ Flat35S (Special)

The interest rate of Flat35S is reduced by a certain rate from that of Flat35 when the house satisfies one of the four high technical standards regarding energy efficiency, earthquake resilience, elderly accessibility, and durability and flexibility. This scheme was launched in 2005. The cost for the reduction has been subsidised by the government, as this measure is a policy mandate. There are two interest rate types of Flat35S. JHF reduces 0.3% per annum for the first 5 years with Flat35S interest rate B type that satisfies "thermal insulation performance grade 4". JHF reduces 0.3% per annum for the first 10 years with Flat35S interest rate A type that satisfies "first energy consumption grade 5". Flat35S interest rate B type houses could save some 60% of heating and cooling energy in houses per annum compared to non Flat35 houses. Resident health also improves, as bronchial asthma and atopic dermatitis decrease in the energy efficient house, owing to reduction of the temperature difference in houses and indoor air quality.

■ Measures for Existing Houses (including renovation)

It is critical to renovate the existing housing supply in Japan, with many vacant houses. In 2005, 61% of the total existing houses were without any energy efficiency measures. Therefore, special technical standards for existing houses to adopt Flat35S interest rate B type were stipulated, which simply require the use of double sashes or insulating glass in the doors and windows. Furthermore, a new program will be launched this October where the interest rate reduction scale will be expanded from 0.3% to 0.6% when the existing house after renovation satisfies Flat 35S regular technical standards. These are not temporary but permanent programs.

■ Rental Houses

JHF provides direct loans with long term fixed interest rates for energy efficient rental houses for households with small children and those with nursing services for the elderly. This is another priority for government policy. The energy efficiency requirement is “thermal insulation performance grade 4”. JHF also promotes energy efficiency of rental houses whose qualities tend to be lower than the owner-occupied houses.

While there are examples of some private financial institutions in Japan providing energy efficiency mortgages by reducing the interest rates or subsidising, these products are not popular. However, this has to be seen in respect to the mortgage interest rates of private financial institutions which is very low (0.625% for ARM, as of August 2016), meaning private financial institutions could hardly reduce the interest rates or provide incentives.

While this Chapter provides testimony that a global transition towards a more sustainable financial system has begun, it is also evident that a variety of incentives, programs and policies exist both between and within countries. The global case studies nevertheless provide interesting and useful precedents against which EU practices can be assessed and compared.

8. ANALYSIS OF FINDINGS

The next phase for the project will be to take a much deeper look at the research summarised above and other relevant sources, with the aim of putting forward some more detailed recommendations on how a European green mortgage might work in practice. However, here we present some initial conclusions at this early phase of the EeMAP Initiative and considerations to take forward for the next steps in the design and delivery of an energy efficient mortgage product in order to ensure its success from a lender perspective. In parallel, to ensure a marketable end product research will be undertaken to understand customer needs, wants and desires in relation to a standardised energy efficient mortgage product. Drawing together the findings described above in relation to green finance, a number of key themes emerge, many of which are recurrent throughout the mortgage lending and funding value chain, that will need to be appropriately considered and where feasible addressed by the EeMAP Initiative:

1. Mortgage origination & Green Buildings

- **Simplicity and standardisation of processes and procedures**, with clear explanations of and guidance on the underlying financing mechanism and its applicability to different types of property (e.g. construction or acquisition of new builds or acquisition and renovation of existing buildings, residential or commercial) in order to enable banks to integrate the product into their internal systems with the minimum amount of cost and administrative burden.

- A clear and comparable framework of **energy efficiency measurement parameters**, with reference to a widely-accepted energy efficiency label(s) and clear guidance on what energy category would qualify for preferential financial conditions linked to the mortgage.
- Linked to the bullet point above, a consistent **framework to review energy performance** on an ongoing basis.
- Appropriate and targeted **communication strategies** to increase awareness and market the energy efficient mortgage, with promotion of the tangible benefits for consumers.
- **Incentives for market participants**, for example, different prudential treatment in terms of a lower risk weight for energy efficient mortgages when properly justified from a credit risk perspective.

2. Risk Management, data & valuation

- Clear **definition of an energy efficient mortgage** (based on the first three bullets of the section above) in order to enable banks to make a **clear differentiation between energy efficient and conventional mortgages** in their risk management processes.
- Guidance and support on **data collection and reporting**.
- Robust **access criteria and monitoring processes** in order to ensure that the system cannot be abused or ‘gamed’, undermining the integrity of the risk mitigation effect.
- Guidance on **quality assurance** to ensure the reliability and robustness of data collected and recorded in internal systems for credit risk assessment purposes.
- Guidance to banks on approach to and content of **instructions to valuers** in relation to what they should take account of in terms of energy efficiency in their valuations of buildings and their subsequent reports – this should also draw on experience from other EU funded projects with a specific focus on sustainability/energy efficiency of buildings and property valuation, namely RenoValue¹⁷ and REvalue¹⁸.
- Increased market transparency through **energy efficiency metrics and data** (see bullet 2 of this section and of section 1 above)

3. Energy efficiency measurement & internal procedures

- **Proportionality and simplicity** (also see first bullet in section 1) **in the energy efficiency measurement parameters** so as to minimise administrative burden and costs in terms of (IT) system adaptation.
- **Energy efficiency measurement parameters should be based on scale which is comparable, but not necessarily harmonised, across the EU** (see bullet 2 in section 1 above) indicating the nature of the energy data to be collected i.e. energy demand, energy consumption or both (or other).
- Accessibility of the **EPC in electronic format**.

4. Green Funding Market

The focus of the EeMAP Initiative is on the development of an energy efficient mortgage product in the first instance, although it is anticipated that an appropriately designed and marketed mortgage product will promote additional synergies in the lending and funding value chain by delivering a new asset class. With this in mind, it is vital to understand the critical elements identified by issuers and investors in relation to the decision to issue or invest in (or not) green bonds. However, although it is clear that some of these elements will intrinsically be addressed by the EeMAP

17 — The [RenoValue](#) project developed a training tool kit for property valuation professionals on how to factor sustainability into the valuation process.

18 — [REvalue](#) aims to incorporate energy efficiency into stock valuation by way of expert panels, data analytics and case studies.

initiative, others, in particular those identified by investors, will be beyond the remit of the current Project but are nevertheless interesting to record.

a) Issuer Perspective

- **Clear definition of an energy efficient mortgage** (based on the first three bullets of section one) in order for issuers to identify eligible loans to back energy efficient bond issuances, whether these be covered bonds, securitisations or senior unsecured bonds.
- Sufficient **data and transparency relating** to ensure the integrity of the eligible asset classes. Interestingly in this respect, an important step forward in terms of availability of loan level data was taken by European DataWarehouse (ED) which published the first green RMBS transactions seen in Europe.

b) Investor perspective

- **Energy efficiency** is by far the **most important sector** from an investor perspective.
- **Transparency** relating to definition, criteria and allocation of what is energy efficient – this could be facilitated through an energy efficient covered bond label (market initiative).
- **State of the art impact reporting** on energy savings and transparency on how this is measured (this is linked to the first bullet in this section).
- Credible and consistent **external review** and **annual reporting** on use and management of proceeds.

9. CONCLUSION & KEY MESSAGES

The extensive research that has been conducted for the purposes of this report indicates that the green finance market in general terms, though growing, remains relatively in its infancy, particularly on the origination side of the mortgage business. The current lack of standardised definitions, adequate data and robust measurement indicators, to name but a few, are key obstacles to the further development of the market. However, what also emerges from the analysis is that there is willingness and appetite from market participants to enter the market and undertake the necessary adaptations to make the transition work. There is also a strong sense that if common best practices across the spectrum described above can be developed and implemented, they will play a significant role in helping to grow this market. It is not too far a leap to anticipate that common best practices in the area of energy efficiency could become a market benchmark for the green finance market more broadly.

Key to the success of the energy efficient mortgage is of course also robust consumer demand; it is therefore vital to increase consumer awareness of the benefits of energy efficiency and the existence in due course of the

energy efficient mortgage product and framework. Synergies between financial institutions and utilities, for example, could help to achieve this.

The analysis above points to a number of elements which will be taken forward in the next stage of the EeMAP Initiative. Many of these elements feature already in the proposed mechanism and will be further developed based on the input received; others are new and will be researched further in order to understand how to integrate them into the final product. These findings will also be crucial in the shorter term for the purposes of the design of a 'minimum viable product' which will be tested in a pilot phase during the second half of the project.

However, the success of the product is also contingent on EU institutional support and the same, coordinated message from the EU institutions with regard to energy efficiency and a potential energy efficiency finance 'sandbox', in which prudential treatment reflects the lower risk of energy efficient mortgages, but only when properly justified. If all of these elements can be brought together EeMAP's energy efficient mortgage will not only make a crucial contribution to the realisation of the Capital Markets Union (CMU), which puts a strong focus on sustainable and green financing, but also, in broader terms, enhance banks' ability to manage their mortgage portfolios through greater transparency and data analysis, helping them to better identify and address non-performing loans and prepare for the long-term risk which climate change poses for financial markets, in this way reinforcing financial stability.

The next phase for the EeMAP Initiative will take a much deeper look at the research summarised above and as the EeMAP Pilot Phase progresses, more detailed recommendations will be put forward. However, the following represent some initial key conclusions relevant for the Initiative's next phase:

- A simple and standardised framework for an energy efficient mortgage would help to pave the way to potential market entry, while a clear definition of an energy efficient mortgage (see Chapter 8 for more details in this respect) would help banks to make a clear differentiation between energy efficient and conventional mortgages in their risk management processes, and in this way build datasets.
- Guidance for banks on how and what to instruct property valuers in relation to the energy performance of buildings would help to ensure that energy efficiency is appropriately taken account of in property valuations. This guidance can draw experience from other EU funded projects with a specific focus on sustainability/energy efficiency of buildings and property valuation, namely RenoValue¹⁹ and REValue²⁰.
- Simple and proportionate energy efficiency measurement parameters, based on comparable processes/frameworks across the EU, indicating the nature of the energy data to be collected, would help financial institutions to integrate energy efficiency into credit risk assessments.



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EeMAP CONSORTIUM MEMBERS



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