



Mortgage info

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European Covered Bond Council
 The Covered Bond Voice of the European Mortgage Federation

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Green Mortgages: Policy, Value and Capital Markets – A Road Map for Market Transformation



By David Rosen PhD, Principal, DRA¹

On the 1st of October 2015, the European Mortgage Federation and European Covered Bond Council (EMF-ECBC) will stage a roundtable on “Financing Energy Efficiency” in Paris (see box). The event will bring together relevant stakeholders, including the European Commission, global and European energy efficiency experts, property valuers and mortgage and covered bond industry representatives with a view to exploring the development of a market-led initiative to:

- Promote energy efficiency retrofits of existing, owner-occupied housing units throughout the EU;
- Provide empirically based improvements in underwriting, credit, valuation, pricing and capital requirements for mortgages used to finance the purchase and purchase/retrofit of energy efficient, owner-occupied homes;
- Reduce greenhouse gas emissions; and
- Increase the supply of capital and improve upon the terms, conditions, pricing and capital treatment of mortgages for energy efficient homes.

A green mortgage credits the homebuyer with greater mortgage paying ability tied to the reduced home energy costs from the energy efficient home. A green mortgage credits the home (collateral) with a higher valuation by capitalising the energy savings of the home, boosts access to capital for energy efficient homes, and may improve capital market performance by lowering the probability of default and prepayment speed.

POLICY CONTEXT

In 2002 the European Union introduced the Energy Performance of Building’s Directive (EPBD), which was restated in 2010. The Energy Efficiency Directive (EDD, 2012/27/EU) introduced binding measures assuring the achievement of increased energy efficiency by 20% by 2020. In 2014, the European Commission (EC) proposed increasing this goal to 30% by 2030. The EC (COM (2011) 0109) describes energy efficiency as the EU’s biggest energy resource, one of the most cost effective ways to enhance the security of its energy supply and decrease greenhouse gas (GHG) emissions. The Energy Efficiency Financial Institutions Group

(EEFIG) calls for energy efficiency to be viewed as “the first fuel, because it is competitive, cost effective and widely available.” The Group cites energy efficiency as the most cost effective approach to reducing the EU’s reliance on energy imports, costing more than €400 billion per year.

Housing is crucial to energy efficiency (EE) policy. In 2011, residential real estate accounted for 18% of global energy consumption (US Energy Information Agency (US EIA)). It is also responsible for an important part of GHG emissions. The US Environmental Protection Agency (US EPA) reports that residential and commercial real estate sectors account for 33% of total GHG emissions in the US. Europe’s buildings are responsible for 38% of total energy demand in the EU (BPIE, October 2014). In 2012, residential buildings contributed 26% of final energy consumption in the EU, nearly double that of non-residential buildings, 14%. (Eurostat)

EEFIG reports that in 2012, global energy efficiency investments across all sectors totalled US \$310 billion. The International Energy Agency (IEA) calls for the EU to invest another US \$1.3 trillion in energy efficiency in buildings from 2014-2035.

EE goals for the residential sector include:

- Reduced energy consumption;
- Reduced GHG emissions;
- Lower occupancy/ownership costs; and
- Preserving older housing stock (and neighbourhoods) by modernisation and reinvestment.

Investment in EE retrofits of the existing housing inventory will extend the useful economic life of that housing. Less expensive EE measures, the so-called “low-hanging fruit,” such as more efficient lighting, appliances and insulation, may be done immediately with quick economic payback. More expensive EE measures such as replacement of doors and windows, heating, ventilating and air conditioning units, and major EE improvements to the building envelope will likely be done in the context of overall building renovation and reinvestment. This may typically occur at sale and/

or refinance. Accordingly, more capital-intensive EE retrofit measures may be incorporated as part of standard practice upon refinancing, sale and reinvestment of existing housing.

In December 2014, the United Nations Environmental Programme Finance Initiative (UN EPFI) sent a letter to the EMF/ECBC suggesting it “develop work on standards for Green Mortgages enabling to imagine (stet) in the future the emergence of green covered bonds.”

EEFIG, created in October 2013, was co-convened between UN EPFI, the European Commission DG Energy, and other financial institutions with a focus on how to finance EE improvements. It issued its Final Report in February 2015: “Energy Efficiency — The First Fuel for the EU Economy: How to Drive New Finance for Energy Efficiency Investments.” Covered bonds are mentioned throughout the Final Report as one of the financial instruments that can “provide long-term finance to sustainable assets like energy efficiency investments” such as Green Mortgages.

In March of 2015, the European Commission and DG Climate Action published “Shifting Private Finance Toward Climate-Friendly Investments.” This report recommends the following:

- “Convene EU covered bond regulators to explore the development of green mortgage backed covered bonds in the future inclusion of renewable assets in covered bond regulatory frameworks;
- Regulators could treat climate-friendly securities and covered bonds differently for capital ratio purposes;
- The European Commission could work with the European Banking Authority (EBA) to integrate issues related to green covered bonds in their next best practices guidelines;
- Expand the rules for covered bond markets to increase issuance of green covered bonds as climate-related asset pools grow; and
- Convene Member State discussions to bring such assets to national qualifying criteria for covered bond pools.”

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more than \$9 billion of transactions and portfolios. Dr Rosen has advised hundreds of governmental jurisdictions and private sector clients on a wide range of financial, portfolio, development and public policy measures in the field of sustainable development and housing finance.

FISCAL SUPPORT FOR ENERGY EFFICIENCY RETROFITS

The EEFIG calls for the direct support of energy efficiency retrofits to buildings, including housing, as a priority for the European Structural and Investment Funds, Horizon 2020, ETS Revenues (Emissions Trading System). Each Member State decides on the use of its EU ETS revenues. However, the EU ETS Directive recommends that at least 50% of these revenues be used for climate action interventions including research and development in energy efficiency and clean technologies. In 2014, DG Energy called for Member States to include Energy Performance Certificates (EPCs) as a requirement for the use of public funds for building retrofits. The Cohesion Policy Programme 2014-2020 provides €23 billion, which could be applied to large-scale energy efficiency retrofit programmes.

Fiscal policy may be applied to provide a combination of rebates, grants, and/or tax subsidies. Such fiscal support may be used to provide a number of programme interventions aimed at increasing the capacity and volume of energy retrofits. Examples of programmatic fiscal support include interest rate subsidies for EE loans and Green Mortgages, loan loss reserve funds, mortgage insurance loss reserves, EPC research and development on standardisation, development of a comprehensive building registry of energy performance, education and certification programmes for energy raters, property valuers, and EE installation contractors, marketing efforts for the green mortgage, development of appraisal/valuation EE standards, and others.

ENERGY PERFORMANCE CERTIFICATES

EPCs have been an integral part of the EPBD throughout the EU since 2002. EPCs aim to serve as a foundational information tool for building owners, purchasers, renters, appraisers, realtors, lenders and capital market players. If capital markets are to encourage energy efficiency, market participants require reliable, verifiable and accurate information about building energy performance (International Partnership for Energy Efficiency Cooperation (IPEEC), 2014). This information will in turn enable analysis of how a building's energy efficiency affects default rates, property valuation, mortgage (and bond) prepayment, and borrower behaviour regarding energy consumption.

The EC highlights the role of EPCs as central for "identification, measurement, accounting for and valuation of the full benefits of energy efficiency investments." This is further widely recognised at Member State level. BPIE cite EPCs with the "potential to become 'building passports' accompanying a building through its life cycle and include improvement proposals and energy renovation activities." (BPIE 2014)

The EC further finds that although "the full potential of the EPCs is not yet being reaped", "a certification scheme is without doubt a key enabler in making

energy performance count in the market." (EC 2013; BPIE 2014)

EPCs may be based on a calculated index of energy consumption, or measured index of energy consumption. In the first case, a building's or unit's energy efficiency is calculated based on the features of the building or unit (e.g., insulation, doors and windows, heating and ventilating, cooking, lighting, and other measures). Measured EPCs report actual meter readings of energy consumption in the building. They more typically reflect the behaviour of occupants, in combination with the energy efficiency measures of the building or unit. The Buildings Performance Institute Europe (BPIE) conducted a 2014 survey of EPCs across Europe. The survey found that while not compulsory, most Member States have set up systems to collect EPC data voluntarily. BPIE notes that Ireland's Building Energy Rating (BER) system, operated by the Sustainable Energy Authority of Ireland (SEAI), is exemplary. Dating from 2003, the BER system was based on best practices in place at the time in the Netherlands and Holland. Building owners and users can access BER ratings from a registry of assessors (Qualified Experts). Ireland's National Administrations System (NAS) assures the availability of energy statistics, as well as the quality of the overall system, by facilitating quality assurance audits of both assessors and certificates.

The EPBD recast requires that an EPC be advertised whenever a building is offered for sale or rent. As of 2015, 26 Member States had some level of compliance with the advertisement requirement. This is compulsory in France.

Standardisation of EPCs, quality assurance for assessors and certificate accuracy, appropriate adjustments for calculated and measured building/unit performance, online access to a universal registry of buildings, units and their certificates will prove necessary for a well-functioning capital market for Green Mortgages.

EPCs seek to develop a common, simple, letter-grade standard to measure the energy efficiency of a whole building or unit. Under the EPBD recast of 2010, Member States were asked to revise national legislation governing EPC schemes and improve them by:

- Introducing an independent EPC control system;
- Assuring confidence of certifiers in the accreditation procedure;
- Introducing penalties for noncompliance, including poor quality of EPC; and
- Increasing the availability of EPCs in sale and rent transactions, and the visibility of the energy label in commercial advertisement (BPIE, October 2014).

In the United States, many states have substantially revised their building codes to require ever-greater energy efficiency. Led by California in 1978 with its Title 24 building code standards, continuously

strengthened by California through 2015, a variety of environmental certification systems have since emerged such as BREAM in the UK, LEED, EnergyStar, Home Energy Rating System (HERS), GreenPoint rating and other systems in the US, PassivHaus, in Germany, Minergie in Switzerland and BBC in France.

GREEN VALUE

The "green value" of a building can be defined by the impact on property value of energy efficiency and other environmentally friendly features, access to public transportation and others. Research on this topic usually focuses on the energy dimension of green value.

The first attempts to assess green value in the US and Europe (Germany and Switzerland) estimated gains of around 5% for "green buildings," mostly commercial, characterised by regulator definitions or certifications. A 2013 study by the European Commission provides similar results, based on an international survey of newly sold or rented housing units. In France, the Capture of Energy Performance Rating (DPE) in the notaries' databases quantified the effect of this label on the sale price of units. For houses located outside of the Paris region, the difference of price due to one energy label letter grade difference (all other factors held constant) averaged close to 5%. (Taffin, Rosen, 2015)

A 2012 study in California assessed the effect of green labelling on the sale price of homes (Kok, Kahn). The study examined 1.6 million single-family home sales in California between 2007-2012. However, of these homes only 4,321 were certified under the EnergyStar Version 2 format, GreenPoint rated, or LEED for Homes. The study controlled for a large number of variables that affect real estate pricing and found a positive correlation between green labelling and price of 9% with an error of +/- 4%. The authors calculate that with an average sale price of non-energy efficient/energy labelled homes in California of US \$400,000 during this period, a price premium for a certified green home equates to approximately US \$35,000 in value for a comparable nearby home. The authors note that the study's findings echo results from prior research in the commercial real estate sector.

A study published in the Appraisal Journal documents that a home value increases US \$20 for every US \$1 decrease in annual energy costs. An analysis by the Pacific Northwest National Laboratory found that building a home that exceeds the Model Energy Code might result in annual energy savings of US \$170-425. Applying these findings to the analysis published in the Appraisal Journal would equate to an increased home market value of US \$4,250-10,625.

A 2015 study performed by the Lawrence Berkeley National Laboratory examined the effect of solar PV systems on home sale prices. The study examined

22,822 sales, 3,951 of which contained PV systems, during the period 2002-2013. PV sale price premiums averaged US \$4/W, or US \$15,000 for an average-sized 3.6-kW PV system. Statistically insignificant differences were found between new and existing home sales. This "PV Value" held consistently across states, housing and PV markets, and home types. The market appeared to depreciate PV systems in their first ten years, a rate which exceeds the rate of PV efficiency losses. The net cost of PV systems, taking into account government and utility subsidies, appeared to be the best proxy for market premiums. The authors note income-based estimates may perform equally well to estimate market premiums, if they can account for local utility tariff structures and subsidies. (Hoen, et al, 2015).

A small Colorado study was inconclusive in quantifying a value premium for energy efficiency of new and existing homes in a variety of Denver submarkets. On an individual case basis, the study did find positive values associated with measures of a home's energy efficiency. However, the authors conclude that "standardised documentation about energy efficiency appears to be in its infancy." (Desmarais, 2015, Colorado Energy Office).

In the US, lenders and appraisers have been slow to recognise the value of energy efficient homes. This is beginning to change. Both the Appraisal Institute and the Appraisal Foundation have undertaken green value assessment programmes for residential real estate. The Appraisal Foundation and the US Department of Energy have entered into a memorandum of understanding to help assure that the uniform standards of Professional Appraisal Practice (US PAP) are applicable for energy performance and green valuations, and that appraisers are trained in the application of these standards. The Appraisal Foundation issued an Evaluation of Green and High-Performance Property: Background and Core Competency in 2015, providing guidance on green valuations for residential, commercial, multifamily and institutional properties.

ENERGY EFFICIENCY AND MORTGAGE RISK

There is a paucity of research linking the energy efficiency rating of a home with the probability of default on the underlying mortgage for that home. The Institute for Market Transformation conducted the only study in the US with researchers at the University of North Carolina Chapel Hill (Sahadi, et al, 2013). The UNC study examined actual loan performance data obtained from CoreLogic by assessing whether residential energy efficiency was associated with lower default and prepayment risks. The authors, accounting for loan, household and neighbourhood characteristics, constructed a study sample of 71,000 EnergyStar and non-EnergyStar rated single-family mortgages. About 35% of the total sample, or 21,000 homes, were EnergyStar rated.

Nationally in the United States, the market penetration of the EnergyStar label in new housing

construction is noteworthy, with approximately 25% of new US housing starts certified as EnergyStar in 2011. To earn an EnergyStar rating, a home must generally achieve a Home Energy Rating Score (HERS) of 85 or better, indicating at least a 15% improvement over homes built to the current market standard (2006 International Energy Conservation Code Standard), normalised to climate zone, size and type of house.

Controlling for other loan performance variables, the study found that owners of EnergyStar homes were, on average, 32% less likely to default on those homes rated EnergyStar, compared to comparable homes without such a rating. The authors note, "This finding is robust, significant, and consistent." Significantly, the study found that a borrower in an EnergyStar residence is 25% less likely to prepay the mortgage than a borrower in a home without such a designation. Furthermore, the study found that within EnergyStar rated homes, default risk continued to decline as the energy efficiency rating of the home improved. The authors conclude that the lower risk of default and prepayment associated with energy efficiency should be taken into consideration when underwriting home mortgages.

ENERGY EFFICIENT MORTGAGES IN THE UNITED STATES AND CANADA

Fannie Mae, Freddie Mac, FHA and the Veterans Administration (VA) have all adopted special underwriting guidelines to take into account energy efficiency of homes for mortgage underwriting. Energy efficient mortgages generally 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 to homes with higher energy efficiency ratings. There is poor data availability on the origination of energy efficient mortgages designed by these guarantee agencies.

In August of 2015, President Obama announced two home energy efficiency initiatives: (1) "stretched" underwriting by FHA for homes with better than average Home Energy Scores (Score); and (2) FHA approval of Property Assessed Clean Energy (PACE) financing on homes, in some cases.

FHA will expand its Energy Efficient Homes (EEH) mortgage product to recognise the home's Score. Homes with scores of six or higher (on a ten point scale) will qualify for a 2% "stretch ratio" on a new or refinance mortgage. FHA housing debt-to-income ratio ("front end ratio") will be increased from 31% to 33%; the "back end" ratio, or total household debt to income, will increase from 43% to 45%.

FHA noted, in announcing the programme, that a home's Score will be calculated by a home energy "Assessor", who inputs information about the home's characteristics into energy modelling software de-

veloped 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. FHA notes that the Score model is used primarily for existing homes. In contrast, the Home Energy Rating System (HERS) score is primarily used for new homes.

FHA's PACE programme addresses a market acceptance challenge. PACE programmes have been enacted in 30 states, and Washington, DC. Under the PACE programme, property owners receive financing for energy efficiency retrofits, which is repaid by property tax assessments on the homes. These assessments have a senior lien position the home's mortgage loan. FHA will make mortgage financing available on homes with subordinated PACE loans, under certain circumstances. FHA has issued guidance on the conditions it will approve financing for homes with PACE loans.

Genworth Canada has developed the Energy-Efficient Housing Programme, whereby homebuyers purchasing an energy efficient home, or making energy saving renovations are eligible for a 10% refund of their mortgage insurance premium. Furthermore, the Genworth Canada EE Housing Programme provides enhanced qualifying features associated with calculating debt service ratios using the estimated reduced heating costs per the EE report on the home. The refund is available for purchase mortgages on new construction or existing homes and for "Purchase Plus" mortgages, which provide for EE improvements through purchase or refinance. To qualify, homes must be 25% more energy efficient than Canada's Model National Energy Code for Buildings.

ENERGY EFFICIENCY RETROFIT LOAN PERFORMANCE IN THE UNITED STATES

The most recent and largest demonstration of home energy retrofit performance, with regards to both energy savings and EE retrofit loan repayment performance, is associated with the Better Buildings Neighbourhood Programme (BBNP) conducted with Stimulus Act funding by the US Department of Energy (DOE). DOE awarded US \$500 million dollars to 41 grantees throughout the US to conduct a wide range of energy efficient retrofit programmes for residential and commercial buildings. Of 99,000 implemented projects, 74,184 were residential EE retrofits, comprising 75% of total BBNP project retrofits. Total energy source savings within the residential EE retrofit programmes were 3.0 MMBtus. BBNP programme participants estimated energy savings of 22% with average actual savings of 15% for a 71% realisation rate. That is, 71% of projected energy savings were realised when building performance was measured post retrofit.

36 of the 41 BBNP grantees used their DOE grant funds to support financing of EE retrofits. 18% of residential retrofit projects received loans. The US State and Local Energy Efficiency Network reports

that 10-20% of residential EE retrofits nationally participate in financing, rendering the BBNP 18% financing rate within expected production. Several independent evaluations of the programme found that financing was not important for most residential participants, but some participants reported that financing was very important for them. Of those that did take out loans, 73% gave high ratings to the role of the loan in their EE upgrade decision. Aggregate default rates on BBNP EE retrofit loans were less than 1%. Despite the very low default rate, EE retrofit loan production was low and did not reach levels necessary to attract broad interest among financial institutions. Multifamily rental EE retrofit loan programmes have found similarly low default rates, with very high loan repayment performance.

A ROAD MAP FOR DEVELOPING GREEN MORTGAGES

Over the last fifteen years, Member States and market participants have developed robust programmes throughout the EU for EPCs, building registries and green value practices. The EC just published a call for capital markets to shift toward green investments, asserting the importance of energy efficiency improvements in buildings (DG Clima, March 2015). Combined with leadership from the EMF-ECBC, this work provides the foundation to develop an EU-wide market for Green Mortgages.

The following components offer a road map for realising the potential of capital markets to promote and accelerate energy efficiency in homes.

1. Refine and Standardise EPCs

Reliable, verifiable EPCs are foundational to establishing a robust market for Green Mortgages. Member States should quickly move to improve the accuracy and currency, assure the quality and apply EPFs to all (residential buildings and units), with the goal of providing a universal and accurate letter grade of energy efficiency throughout the diversity of building types, climates, fuel sources and utility tariffs in the EU. This goal is best met

by building on substantial best practices already in place among a number of Member States.

2. Develop a Universal Building Registry of Energy Performance

Once again, building on existing best practices such as those found in Ireland and other Member States, develop online, searchable databases of building energy performance, measured by state of the art EPCs described above. These building registries of energy performance should be universally open, current and available to all market participants: buyers, owners, tenants, sale and leasing agents, mortgage lenders, regulators and researchers.

3. Establish and Standardise Disclosure Requirements

Member States should build upon current best practices to establish, standardise and require universal disclosure of building and unit energy efficiency (EPC). Capital market participants may begin requiring a current, accurate EPC for underwriting and originating green mortgages, whether for mortgage purchase, refinance and/or energy efficiency retrofit financing. This may be done at sale, lease, refinance for an interim period while EPC practice and building registries are perfected in the coming years. Or it may be required at a certain date, thereby motivating market participants. Such disclosure should become standard practice in any marketing or advertising of homes for sale or rent.

4. Provide Strategic Fiscal Support for Green Mortgages

Fiscal support will be required to accelerate the development of a mature, functioning market for green mortgages. Key interventions will include:

- EPC and building registry development;
- Marketing campaigns to educate all market participants of the value of energy efficiency, the use and reliability of EPCs and building reg-

istries, and the availability of green mortgages and valuations;

- Credit subsidy programmes (rebates, grants, mortgage insurance loss reserves) to establish empirical data on probability of default, prepayment, valuation, energy consumption; market pricing and other measures critical to a large scale, efficient capital market;
- Training, quality control and certification programmes for raters, valuers and retrofit contractors.

5. Develop Green Mortgage Products

The mortgage industry and capital markets should work with regulators to develop green mortgage products for purchase, refinance and/or retrofit. Building upon current best practices in Europe and abroad, this loan product development effort should test and establish proven standards for default risk, prepayment, loan to value, debt to income and pricing adjustments for energy efficient (green) homes. As the market for green mortgages expands and matures, lenders, investors and regulators should develop liquidity facilities such (green) covered bonds and (green) mortgage or asset backed securities.

6. Adjust Capital Requirements for Green Mortgages

Banking and capital market regulators should work with the mortgage industry to establish capital requirements for green mortgages, and green bonds backed by such mortgages, that recognise empirically demonstrated improvement in loss, default and prepayment experience.

CONCLUSION

While ambitious, current EU policy, fiscal resources and best practices among Member States and market participants place the goal of a mature, functioning market for green mortgages well within reach. Such a market will help accelerate improvements in the energy efficiency of homes across the EU.

