



Transition risk associated with real estate exposures calls for data on energy performance



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ABSTRACT

This article – which is based on a presentation given on 28 October 2021 during a webinar organised by the Belgian Financial Forum – will first explain how energy efficiency of real estate exposures may be an important risk factor for the transition risk to which the Belgian financial sector is potentially exposed. As exposures to energy-inefficient buildings are likely to be more subject to transition risk, the article also shows why financial institutions need to gather information on the energy performance of their real estate exposures and incorporate this information in their risk management.

There is a growing consensus that meeting the targets set by the Paris agreement, that aim to limit global warming to well below 2°C above pre-industrial levels, and fulfilling the EU’s ambitions to achieve climate neutrality by 2050¹ are necessary in order to avoid major physical climate-related risks such as more frequent and more severe droughts, floods, storms, etc. A transition towards a carbon-neutral and more sustainable economy is therefore required. However, if this transition occurs too abruptly, this can also cause major losses due to sudden structural changes in the economy. To avoid both physical and transition risks, the transition should therefore be as gradual as possible. To this end, a coherent, decisive and timely climate policy is needed, with explicit actions that are notified well in advance for every market participant to be able to prepare for the changes they will inevitably face. The longer action is postponed, the harsher the measures

¹ This ambition was set out in the EU long-term strategy “A clean planet for all” (2018), reaffirmed in “The European Green Deal” (2019) and translated into a legislative proposal for a European Climate Law in March 2020.

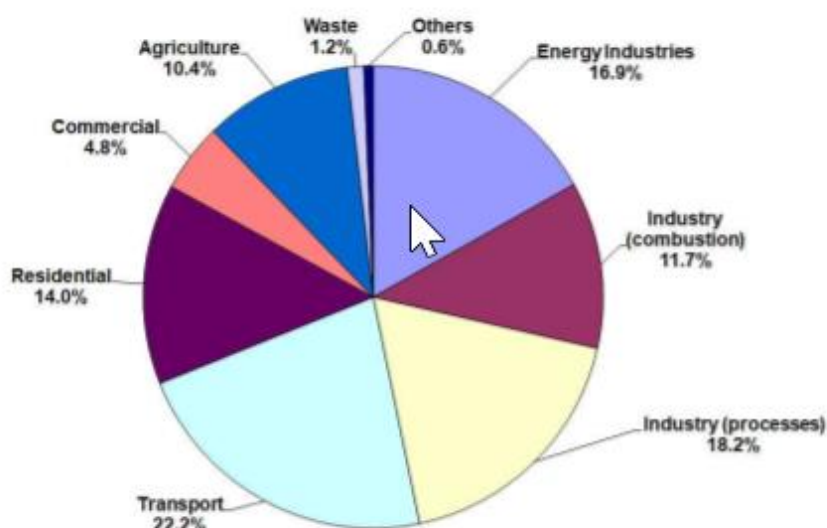
will have to be in order to attain the emission reduction targets, and the bigger the transition risks will be. Policymakers are therefore encouraged to agree on credible and concrete policy measures to reduce greenhouse gas emissions in short order, so as to limit transition risks as much as possible.

While it is evident that greenhouse gas emissions will have to be reduced in Belgium, it is not entirely clear at this stage how this reduction will be implemented. Nevertheless, improving the energy efficiency of the Belgian building stock seems to be at least one very important avenue for reducing greenhouse gas emissions. In addition, Belgian financial institutions have very large real estate exposure, entailing a material risk for Belgian financial stability.

1. Real estate as main contributor to greenhouse gas emissions in Belgium

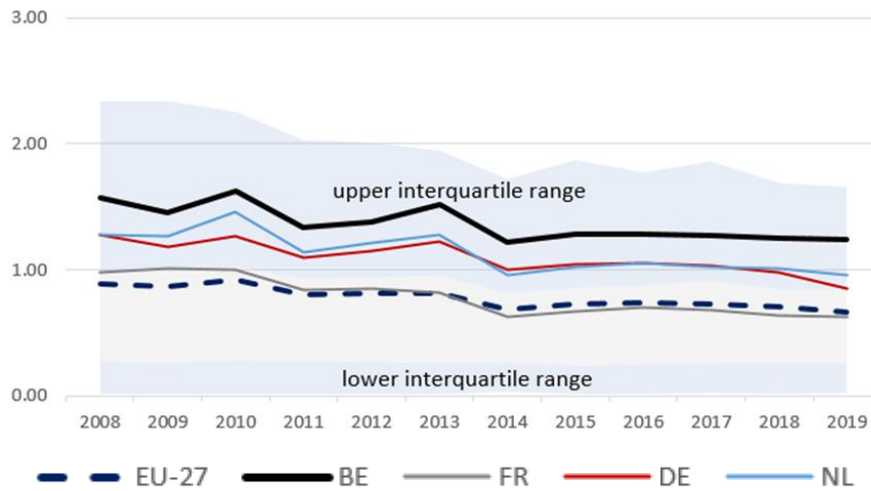
As illustrated in Chart 1, buildings (14% residential, 4,8% commercial) are among the main contributors to greenhouse gas (GHG) emissions in Belgium. Belgium's building stock includes a high proportion of old buildings and independent houses, rather than – usually more efficient - apartments. Moreover, Belgian homes tend to have above average living space per person for all income classes, and natural gas is the main source of heating in Belgian houses. Belgian households' emissions from heating and cooling are therefore significantly higher than the European average, as shown in Chart 2.

Chart 1 - Contributions to GHG emissions in Belgium, by sector (2018)



Source: Vlaamse Milieumaatschappij (VMM), Belgium's greenhouse gas inventory (1990-2018).

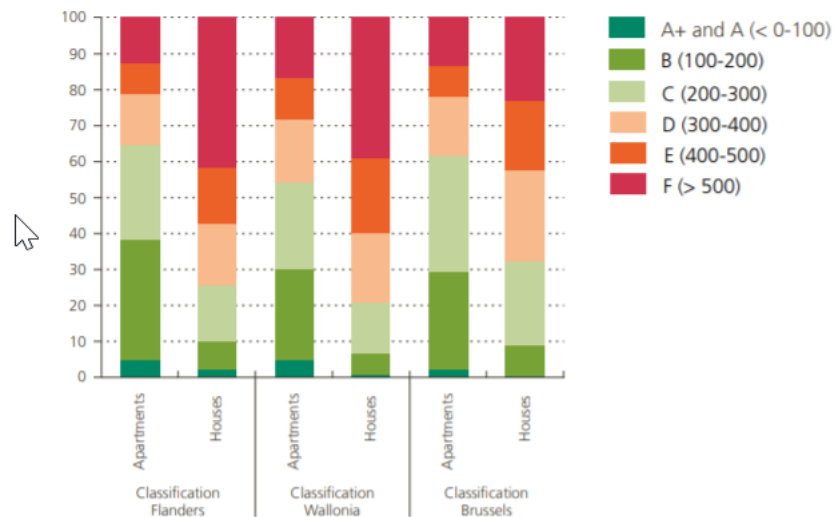
Chart 2 – Greenhouse gas intensity in Belgium and the EU-27, households – heating and cooling (tonnes of CO2 equivalent per capita)



Source: Eurostat.

Not surprisingly, the share of energy-efficient buildings in the Belgian residential real estate market is currently very low, which is illustrated in Chart 3. The chart is based on aggregate data provided by the three Belgian Regions in relation to the energy performance of residential buildings that have been newly built, sold or rented out over the last ten years. While energy labels are not comparable across the Regions, we have taken into account the energy score, an indicator that specifies how much primary energy consumption there is per square metre of floor space (kWh / m²), and translated it into the labelling system used in Flanders. This labelling system will be used throughout this document.

Chart 3 - Distribution of energy efficiency scores and labels (labelling system used in Flanders) of residential buildings



Source: Regional energy/environmental agencies. Period covered by database: Flanders 2009-2019 – Wallonia 2010-2019 – Brussels 2011-2019.

2. Policy measures directed at reducing real estate GHG emissions

More and more policy measures are being taken to reduce GHG emissions, and they are becoming increasingly ambitious. The EU aims to become climate-neutral by 2050, meaning that the European economy must achieve net-zero greenhouse gas emissions by that year, with a 55% reduction of GHG emissions by 2030. These policy measures include the further strengthening of the emission trading system, with increased carbon prices as a consequence. Nevertheless, it is clear that all European countries have to take additional measures in order to reach the goals set by the Paris agreement, as well as the EU targets for 2030 and 2050. While the precise policy actions to be taken have not yet been determined, the renovation of both public and private buildings has been singled out as a key initiative to drive energy efficiency and deliver on the objectives in the European Green Deal.

According to Hans Bruyninckx, director of the European Environment Agency, Belgium is one of the countries with the biggest policy gap in relation to the 55% GHG reduction to be reached by 2030.

In both the Belgian Energy and Climate plan for 2021-2030 (NECP 2021-2030) and Belgium's long-term strategy for 2050, the buildings and transport sectors are mentioned as being the most important sectors for taking further measures to reduce greenhouse gas emissions in Belgium. The NECP outlines several federal and regional measures to lower GHG emissions of buildings. All Regions are planning large-scale renovations of their public buildings. On a federal level, the aim is to improve energy efficiency of buildings so as to increase the energy neutrality of federal buildings to 50% by 2030 and 100% by 2040. Other measures aimed at improving the energy efficiency of the existing building stock include stricter norms for renovation and subsidies for better building insulation. Flanders will also require a minimum energy-label for large non-residential buildings by 2030 and, as of 2022, imposes a renovation requirement within 5 years of the purchase of a non-residential building. Under the adjusted Flemish Energy and Climate plan of November 2021, new owners of residential houses with an energy label of E or worse will, as of 2023, also be required to renovate within 5 years. In addition, a reduced VAT rate for demolition and reconstruction is envisaged, subject to approval by the European Commission. Aside from building renovations, other measures are mentioned, such as a ban on oil-based heating systems in new buildings as of 2021 and in existing buildings from 2035 (Flanders), as well as the potential prohibition of natural gas-based heating systems in new building areas as of 2030. Most of these measures, however, seem to be directed towards new buildings, for which energy efficiency requirements are already in place, and thus have a limited impact on the existing housing stock.

With regard to long-term goals, all three Regions are hoping to reach an average emission of 100 g/Kwh for the residential building stock by 2050, with Brussels even setting this target for its entire building stock. For tertiary buildings (occupied by public authorities, associations and companies providing services), carbon neutrality is envisaged by 2050.

Although the final NECP no longer mentions an environmental energy tax, research is unanimous about the carbon-reducing effect of a carbon tax. Moreover, none of the studies conducted indicate any important and unsurmountable social and economic costs of a carbon pricing policy, provided that the revenues from such a tax are redistributed². The potential introduction of a carbon tax is likely to have an impact on energy renovations, as these will become more profitable.

Belgium's current NECP, with targets for 2030, does not meet the targets set by the European Union. Furthermore, at the current renovation rate, the targets for 2050 as set by the federal and regional governments will not be met either. As more than 95% of the Belgian housing stock currently does not meet the energy label A target (see Chart 3 above), and more than 60% of Belgian houses are more than 50 years old (VEA, 2019b and Statbel 2019), there is a very strong need for renovation and, in some cases, demolition

² Burggraeve, K, De Mulder J and De Walque G (2020), Fighting global warming with carbon pricing: how it works, field experiments and elements for the Belgian economy, NBB Economic review, December 2020.

and reconstruction. To raise the renovation rate from the current level of less than 1% to the required 3%, additional measures will have to be taken (VEA, 2019b).

A plausible policy measure would be to impose a minimum energy efficiency requirement for the existing housing stock before 2050, as will already be the case in Flanders for large non-residential buildings as of 2030. In the Netherlands, commercial buildings will have to meet a minimum energy standard from 2023 onwards, and in the UK, properties with an energy performance label in the lowest two categories (F and G) may not be rented out as new leases or renewals as of April 2018, a measure that will be extended to existing leases from 1 April 2023, with significant penalties for non-compliance. It is not unlikely that these measures will be expanded in scope or be tightened come in order to attain the emission reduction goals.

However, attaining an energy label A for the entire housing stock would require major investments. The exact investment required of course varies depending on the age, type and size of the building. While estimates are very difficult to produce, the average cost for a house to obtain an energy label A in Flanders is estimated at somewhere between €40 000 and €65 000 (Ryckewaert *et al.*, 2019; VEA 2019b; SERV, 2019). Although the energy renovation costs per home tend to be the same in absolute terms, the poorest owners have much higher energy renovation costs relative to their income (Ryckewaert *et al.*, 2020). The total investment cost for attaining a full energy-efficient housing stock by 2050 is estimated to be €110 billion for Flanders³, €28.8 billion for Brussels⁴ and €63 billion for Wallonia⁵. Although this investment would result in major energy savings, the payback time of these energy renovations in terms of energy cost savings can still be very long, depending of course on energy price trends and potential energy taxes.

Public and private financing mechanisms may therefore be necessary, especially for poorer households. To a certain extent, the NECP is already considering some measures to avoid or reduce energy poverty, such as subsidies for renovating rented houses and houses of certain “protected” customers⁶, social energy tariffs and free energy audits of houses. The Energy Efficient Mortgage Initiative (EEMI)⁷ is an example of a private initiative aiming to encourage energy efficiency renovations by reducing the cost of lending for these investments. In addition, while more renovations and rebuilding can have a positive impact on the construction sector and create many job opportunities, potential supply constraints in the building sector would also need to be tackled.

³ Ryckewaert *et al.* (2019)

⁴ *Energieklimaatplan Brussels Hoofdstedelijk Gewest 2030* (2019)

⁵ *Stratégie Wallone de rénovation énergétique du bâtiment à long terme* (2017)

⁶ Customers entitled to the maximum social price for electricity and natural gas qualify as ‘protected customers’.

⁷ The Energy Efficient Mortgage Initiative aims with its Energy Efficient Mortgage Action Plan (EeMAP) to create a standardised “energy-efficient mortgage”, which gives building owners an incentive to improve the energy efficiency of their buildings or acquire an already energy-efficient property by way of preferential borrowing conditions. At the heart of this Energy Efficient Mortgage Initiative is the assumption that energy efficiency has a risk-mitigation effect for banks as a result of its impact on borrowers’ ability to service their loans and on the value of the property. This means that energy-efficient mortgages will carry a lower risk on banks’ balance sheets and could, therefore, qualify for better capital treatment.

3. Belgian financial sector's exposure to real estate

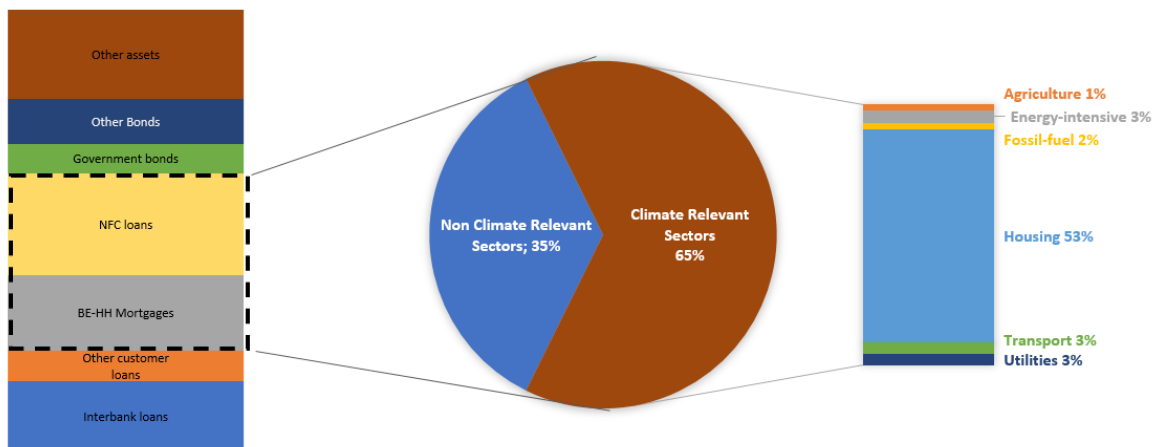
Real estate is not only a major contributor to GHG emissions, and therefore potentially subject to additional policy measures and transition risk, but also represents a very large share of Belgian financial institutions' assets. In order to capture transition risks, we focus on climate policy relevant sectors, i.e. emission-intensive sectors, as they are most likely to be targeted by policy measures aimed at reducing GHG emissions. This is illustrated in Chart 4.

For banks, we focus on the loans and mortgages granted to non-financial corporates (NFCs). If we combine NFC loans and mortgages, at the end of 2020 about 65% of these exposures can be considered as climate policy relevant, i.e. with counterparties in emission-intensive sectors. When solely considering loans to NFCs, 39% are climate policy relevant, with the bulk of the loans in real estate-related sectors.

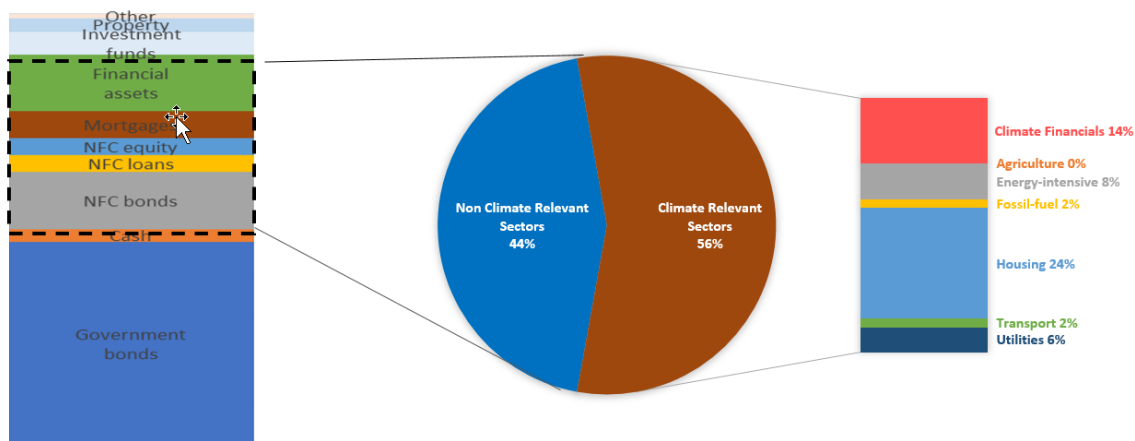
For the insurance sector, in 2019, 56% of equities, corporate bonds, loans and mortgages are in sectors that are considered to be exposed to transition risk. Also for the insurance sector, these exposures are the largest in the real estate sector.

Chart 4 - Belgian financial sector exposure to climate policy relevant sectors

Banking sector (end 2020 data)



Insurance sector (end 2019 data)



Source : NBB.

4. Transition risk related to real estate exposures in the Belgian financial sector

While policy measures such as imposing minimum energy efficiency standards or encouraging energy-saving renovations through energy taxes could provide major opportunities for banks, as loans can be offered to finance these renovations, such policy measures could also create transition risk for the existing stock of loans collateralised by real estate in several ways, especially if these measures need to be taken abruptly.

With regard to setting minimum energy efficiency standards, if owners make the energy efficiency improvements, owner-occupiers will save on their energy bills, thus improving mortgage repayment capability. Also, tenants will have lower energy costs and will be more able to pay their rent, in turn reducing the credit risk of the owner. On the other hand, the extra investment required may, of course, also have a negative impact on borrowers' repayment capacity (or their financial margin to absorb unexpected income shocks), at least in the short term when the effect of energy savings might not yet be fully felt.

However, if the necessary adjustments are not made to meet the new standards, due to a lack of resources for the additional investment, inability to find a construction firm owing to the high demand caused by the new measure, or simply because people are not willing to make the investment, the value of these energy-inefficient buildings could be severely affected. This could potentially have a significant impact on real estate markets and collateral values for mortgage loans, effectively pushing up the credit risk of these loans. Credit

risk of buy-to-let mortgages will also increase if home owners can no longer rent out buildings that do not meet the energy efficiency standards, raising the probability of default.

The introduction of an energy tax may also push up the credit risk of mortgage loans granted to owners of energy-inefficient homes, as a rise in energy prices could reduce the reimbursement capacity of the families and businesses occupying these buildings, while more tenants may be unable to pay their rent due to higher energy costs.

A number of studies have already analysed the relationship between the credit risk of mortgages and the energy efficiency of the property used as their collateral. The Bank of England (2020) has found evidence suggesting that, in the UK, mortgages on energy-efficient properties are less frequently in payment arrears than mortgages on energy-inefficient properties. In its analysis, the BoE has controlled for several other determinants of mortgage defaults, such as borrower income and the loan-to-value ratio. However, other factors such as financial literacy or risk aversion of the borrower have not been controlled for. Consequently, a causal relationship between energy efficiency and lower mortgage payment arrears cannot be derived *per se* from this analysis, although energy efficiency does prove to be a relevant predictor of mortgage payment arrears. An older study by Kaza *et al.* (2015) also found that default risks are significantly lower in mortgages on energy-efficient properties in the United States, although the authors did not control for some important characteristics such as borrower income, which is important as higher EPC levels can be expected to be associated with higher income levels (Adalilara *et al.*, 2015).

The European Commission's Joint Research Centre (JRC) has carried out an extensive literature review (Zancanella *et al.*, 2018), indicating that energy efficiency improvements raise the price of residential real estate by 3-8%, while pushing up residential rent by 3-5%. For commercial buildings, the sales price premium seems to be even higher (10%-20%), while the increase in rent is somewhat lower (2-5%). Differences of course exist across regions and countries, as well as different property types. While there is already a vast range of literature on the link between energy efficiency and house prices in various European and non-European countries, studies for Belgium are limited in number. A study by S. Damen (2019) indicated that residential property in Flanders with an energy label B are being sold at a price that is on average 10.9 % higher than a comparable house with an energy label E. In addition, the time it takes to sell the more energy-efficient houses is on average 25 days shorter. The price difference for apartments is smaller (+3.2%) and there appears to be no significant difference in the time it takes to sell an apartment based on its energy efficiency. A potential explanation can be the lower average energy consumption of apartments⁸. What is more, the price difference for energy-efficient houses appears to have widened over time, which is consistent with the assumption that people are becoming more aware of the relevance of energy efficiency in their homes. Looking to the future, with a possibility of new policy measures raising the minimum energy efficiency standards of houses and a potential increase in energy prices, one can only expect this price difference to widen.

⁸ 290 kWh/m² compared with 481kWh/m² for houses) (VEA, 2019a)



As such, it appears that energy efficiency is a determining factor for both the collateral value of mortgage loans and the probability of default on these loans. As future policy measures such as imposing minimum energy efficiency standards and energy taxes are likely to make these relationships even stronger, energy efficiency is important information for financial institutions to take into account in the credit risk assessments of their mortgage portfolios.

5. Addressing transition risk related to real estate exposures

As the energy performance of the real estate investments and buildings of which the acquisition or renovation is financed by financial institutions may be an important risk factor for the transition risk to which the Belgian financial sector is potentially exposed, it is important that financial institutions start analysing to what extent the energy efficiency of their real estate exposures may impact their current and future credit risk. As revealed by the sector survey performed by the National Bank of Belgium (NBB) in 2018, institutions currently do not have information on the energy performance of their real estate exposures in their information systems (NBB Financial Stability Report, 2019). The NBB has therefore actively supported the financial sector's request to gain direct access to the regional databases containing energy performance certificates of residential buildings that have been newly built, rented out or sold over the last ten years⁹. However, as this access to regional databases is subject to certain technical considerations and data confidentiality, this may not be possible in the short term.

In view of these uncertainties, the NBB has reiterated its recommendation to the sector to immediately start gathering energy performance certificates for financed real estate, and not merely wait for possible access to the regional databases. The gathering of these certificates is also essential for the commercial real estate market, for which the certificates (LEED, BREEAM or other relevant certificates) are not collected in a central database. While the NBB is well aware that this may involve certain difficulties, such as the unavailability of the energy performance certificate at the time of conclusion of the loan agreement, the importance of the information contained in these certificates is adequate justification for financial institutions to put in place as soon as possible the necessary procedures to systematically obtain the energy performance certificates for new loans that finance or are guaranteed by residential or commercial real estate and, as far as possible, for existing loans with a significant amount outstanding, as well as for all significant direct investments in this market. This recommendation was already mentioned in the thematic articles of the 2019¹⁰ and 2020¹¹ NBB Financial Stability Reports and was subsequently communicated specifically to the financial sector.

As it became clear that financial institutions were not making sufficient progress in gathering data on energy efficiency, the NBB published a circular in December 2020 requiring them to start gathering such data for

⁹ Flanders 2009-2019 – Wallonia 2010-2019 – Brussels 2011-2019

¹⁰ Bourtembourg, J., Dumont L; Francart A. and Van Tendeloo B. (2019), Climate related risks and sustainable finance, results and conclusions from a sector survey, NBB Financial Stability Report 2019.

¹¹ Van Tendeloo, B. (2020), Climate-change related transition risk associated with real estate exposures in the Belgian financial sector, NBB Financial Stability Report 2020



residential mortgage loans, corporate loans with real estate as collateral or other commercial real estate exposures, for new exposures as of 2021 as well as for existing exposures as of 2017 with a remaining loan-to-value ratio of more than 85%. The circular also requires institutions to start reporting this data to the NBB for new residential mortgage loans.

While financial institutions can analyse the past relationship between energy efficiency and credit risk of their real estate exposures once they have access to energy efficiency data, the impact in terms of transition risk will have to be assessed using scenario analyses and stress testing, which is generally considered the best way to assess climate-related risk (NBB FSR 2019, NGFS 2019). An example of how such a scenario analysis of a potential abrupt introduction of a minimum energy efficiency standard for residential real estate on the banking sector's mortgage portfolio can be performed, is described in the box below. Although very useful to gain some insight into the potential risks and effects, it should be borne in mind that climate-related risks have an impact on the economy and financial sector through various direct and indirect transmission channels. In addition, climate-economic models are inherently incapable of representing all these interactions, effectively overlooking many social and political forces that will strongly influence the way the world evolves. The outcomes of a scenario-based analysis should therefore be assessed very cautiously and cannot suffice to guide decision-making (BIS, 2020).

However, it is clear that the longer action is postponed, the more abrupt the policy measures will have to be in order to attain the targets necessary to combat climate change, and the larger the actual transition risks resulting from these measures will be. The financial sector itself has realised the urgency of the matter and is therefore trying to encourage energy-efficient renovation with the Energy Efficient Mortgage Initiative (EEMI). If risk analyses show that loans for improving the energy efficiency of buildings involve lower risks, institutions could charge lower rates for such loans. By providing cheaper funding for energy-efficient renovations, home owners and businesses are encouraged to make their buildings more energy-efficient, and banks can contribute to mitigating potential future transition risk.



Scenario analysis of an abrupt introduction of a minimum energy efficiency standard in Belgium

A sudden introduction of a minimum energy efficiency standard for real estate could lead to a fall in the value of buildings that are not brought up to standard, due to a lack of resources to make the additional investment, inability to find a construction firm owing to high demand caused by the new measure, or because people are not willing to make the investment.

In order to assess the potential impact of such a policy measure, assumptions need to be made as to the percentage of buildings that will not be brought up to standard. In addition, assumptions have to be made regarding the price impact on a property that does not meet the standard. While we have an indication of the current price impact of differences in energy efficiency of residential property in Flanders, based on a study by Damen (2019), this price impact will most likely be larger once a binding policy measure is announced and put in place. In addition, the price impact may also differ across the different Regions within Belgium. Assumptions would also need to be made regarding the mortgage default rates, which would most likely be higher for less energy-efficient home loans, as shown in the literature, and which may also rise, especially if other measures such as energy taxes are taken as well. It should also be borne in mind that households with the lowest incomes generally live in the least energy-efficient homes, as found by Ryckewaert *et al.* (2019) for Flanders. Finally, the energy performance certificates of all the residential real estate exposures of the banks would need to be known.

Conclusion

As it appears that the energy efficiency of real estate exposures may be an important factor for the transition risk to which the Belgian financial sector is potentially exposed, it is of utmost importance that financial institutions start gathering data on this subject. While the NBB is in favour of financial institutions having access to the regional databases containing information on energy performance of residential buildings, financial institutions must start gathering this data themselves as soon as possible, both for residential and commercial real estate exposures. They should also start analysing to what extent the energy efficiency of their real estate exposures may impact their current and future credit risk, and subsequently manage and mitigate the transition risk associated with their real estate exposures.



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