

GREENWASHING RISKS FOR THE LUXEMBOURG REAL ESTATE SECTOR

Greenwashing – Luxembourg – European Union – Real Estate – Sustainability – Environmental – Social and Governance – European Green Deal – Greenhouse emissions – Net Zero

Climate change is disrupting living conditions and economic activities with increasing frequency. This has led the public opinion to raise awareness of the issue and put pressure on governments and companies to take seriously risks stemming from the worsening of climate conditions due to the overexploitation of natural resources and excessive pollution of the planet. In this context, the real estate sector is perceived globally as the most polluting sector and the one characterised by the highest level of complexity for the achievement of an effective decarbonisation within EU and global targets. As a result, it can be inferred that this sector is largely exposed to greenwashing in the way that consumers' preferences do not match the offers or declarations of operators regarding the environmental sustainability of their products and services. This study aims to identify greenwashing risks in the real estate sector by taking Luxembourg as a reference country within a broader European perspective as the EU has shown a proactive stance towards the challenge of the transition to the 'Net Zero' both from the financing and regulatory point of view. In fact, the legal analysis undertaken in this article will reveal that legislation at the EU level acts as a bond and an inspirer for national strategies and objectives aimed at countering the phenomenon of greenwashing.

I. INTRODUCTION

Over the recent years, environmental-related topics progressively assumed priority in public debates and, consequently, in political agendas. This trend has caused consumers to start redirecting their choices towards products and services limiting their harmful effects on the planet; contributing to the ecological transition; achieving zero emissions; or even helping to improve current precarious environmental conditions. The impetus given by an improved social consciousness, mainly driven by youth protests, has 'forced' world leaders to take into greater consideration the environmental concerns that scientists have been preaching for long.¹

As a result, a twofold transformation is taking place. On the one hand, companies are seeking out of their own volition to change or improve their production processes, products, and services to accommodate these new demands. On the other hand, governments are putting in place policies and

funding to support the transition, guiding and incentivising companies that are less inclined to transform their processes, a resistance due to high costs and to an entrepreneurial culture that sees profit as its core value and objective.

Although this trend is driven by positive aspects of crucial importance for the survival of the human species, it is not exempt from risks and the greatest risk is represented by the so-called greenwashing. The term greenwashing was originally coined in 1986 by Jay Westervelt, a distinguished environmentalist who used this term to identify organisations, such as hotels, that advertised themselves as being eco-friendly but that lacked environmental objectives,² being limited to cost-saving practices as, for example, promoting 'the reuse of towels as part of a broader environmental strategy'.³ Since then, the term was employed in different contexts and now, it is often understood as a dissemination of false or misleading claims about sustainable practices of a company or the environmental benefits of a product or service.

1. C. THOMPSON, 'How 19th Century Scientists Predicted Global Warming', *JSTOR Daily*, 17, 2019.
2. E. ORANGE and A. M. COHEN, 'From eco-friendly to eco-intelligent', *The*

Futurist, 28 [30], 44 (5), 2010.
3. K. BECKER-OLSEN, 'GREENWASHING' (2013) S. O. Idowu et al., *Encyclopedia of Corporate Social Responsibility* 1318 Springer, Berlin, Germany 2013, [1318].

LEGITECH

The European Union (EU) legislator defined greenwashing in Recital (11) of the Taxonomy Regulation as a 'practice of gaining an unfair competitive advantage by marketing a financial product as environmentally friendly, when in fact basic environmental standards have not been met',⁴ whereas in the proposal for a Green Claims Directive, greenwashing is understood as the use of unclear or not well-substantiated environmental claims.⁵ The legislator has also engaged in defining the notion of environmental claims, in fact the Proposal for a 'Greenwashing Directive'⁶ foresees an amendment to Article 2(1)(o) of Directive 2005/29/EC (the Unfair Commercial Practices Directive)⁷ stating that, 'any message or representation, which is not mandatory under Union law or national law, including text, pictorial, graphic or symbolic representation, in any form, including labels, brand names, company names or product names, in the context of a commercial communication, which states or implies that a product or trader has a positive or no impact on the environment or is less damaging to the environment than other products or traders, respectively, or has improved their impact over time'.⁸

Greenwashing is commonly associated with selective disclosure⁹ in marketing strategies as a form of deception, meaning that claims by companies on products and services mislead consumers by virtue of the use of buzzwords, such as 'natural', 'clean', 'sustainable', and 'ecological' or prefixes such as 'eco' and 'bio' that recall environmental-friendly practices and/or objectives or situations in which organisations downplay or hide information regarding a negative impact on the environment and/or emphasise those aspects by indicating a positive environmental performance. This kind of marketing language may not only be misleading, but also unverifiable as, for example, when a product marketed as 'bio' is not certified as coming from organic agriculture.

A study conducted by the European Commission in 2009 on 26,500 citizens of the 27 EU Member States (MS) and Croatia¹⁰ showed that the environmentally friendly nature of a product is relevant for consumers' purchasing decisions.¹¹ In fact, for 34% of respondents, the impact of a product on the environment is a 'very important' while it is

'rather important' for 49% of them. This study further revealed that when deciding what product to buy the environmental impact of the product is more important than a product's brand name for the majority of respondents.¹² Consumers' willingness to buy sustainable products can genuinely contribute to a positive change, but greenwashing prevents consumers from making 'real' environmentally friendly choices and thus hampers their active participation in the green transition. Misleading practices and unsubstantiated green claims do not enable consumers to make informed decisions, thus negatively influencing their trust in the market for sustainable products and services. Moreover, companies that put honest efforts to integrate environmental objectives in their business operations are put at a competitive disadvantage compared to those who falsely create their eco-responsible image.¹³

Greenwashing practices are growing in parallel with consumer and governmental attention to environmental issues. Evidence by the European Commission suggests that over 53% of environmental claims are potentially misleading.¹⁴ That means that a considerable number of environmental claims are vague, inaccurate, or simply unsubstantiated. This criticism is corroborated by a systematic review conducted by researchers revealing that greenwashing has become a significant problem over the past decade,¹⁵ showing the need for a standardised approach.

Greenwashing practices are particularly well known for certain types of industries, such as food or textile, there are economic sectors highly exposed to these practices that do not get the same attention. The real estate sector belongs to this category and this article aims at identifying the presence of greenwashing risks for the Luxembourgish real estate sector. This EU country has been chosen by virtue of the presence of environmental risk factors that can affect new or existing settlements and by the scarcity of housing supported, *inter alia*, by demographic growth, in turn due to a dynamic and continuously developing labour market boosted by an attractive and expanding financial sector. While Luxembourg experienced a constant increase in property prices over the last decade,¹⁶ such increase was registered until the unprecedented path

4. Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088 [2020] OJ L198/13.
5. European Commission, *Proposal for a Directive on substantiation and communication of explicit environmental claims (Green Claims Directive)*, COM (2023) 166 final, 22 March 2023.
6. European Commission, *Proposal for a Directive of the European Parliament and of the Council amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and better information*, COM/2022/143 final, 30 March 2022.
7. Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market and amending Council Directive 84/450/EEC, Directives 97/7/EC, 98/27/EC and 2002/65/EC of the European Parliament and of the Council and Regulation (EC) No 2006/2004 of the European Parliament and of the Council [2005] OJ L149/22.
8. See Art. 1 of the Proposal for a Greenwashing Directive.
9. Ch. MARQUIS et al., 'Scrutiny, Norms, and Selective Disclosure: A Global Study of Greenwashing', *Organization Science*, 27 (2), 2016.
10. Please note that Croatia is a member of the EU since 1 July 2013. Therefore,

in 2009, the 27 EU MS included the UK as Brexit officially took place in February 2020.

11. European Commission, *Europeans' attitudes towards the issue of sustainable consumption and production*, Flash Eurobarometer, April 2009.
12. European Commission, *Europeans' attitudes towards the issue of sustainable consumption and production*.
13. D. SILVA, 'The fight against greenwashing in the European Union', 7(2) *UNIO-EU Law Journal*, 2021.
14. European Commission, *Impact Assessment Report Accompanying the document Proposal for a Directive of the European Parliament and of the Council amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and better information*, 30 March 2022, SWD(2022) 85 final, 1 [10].
15. S. V. DE FREITAS NETTO et al., 'Concepts and forms of greenwashing: A systematic review', 32(19), *Environmental Sciences Europe*, 2020.
16. According to Eurostat, house prices 'more than doubled' in Luxembourg in the period between 2010 and 2023. See Eurostat, *House prices down, rents up between Q3 and Q4 2023*, 4 April 2024, available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240404-1>, last accessed 5 May 2024.

of interest rate hikes by the European Central Bank. Since late 2023, as a result of the ten consecutive rate hikes, Luxembourg suffered one of the steepest contractions in property prices in the EU.¹⁷ This dynamic, combined with recent bankruptcies in the construction sector, is putting additional pressures on the Luxembourg real estate sector. In this context, the phenomenon of greenwashing in the Luxembourg real estate sector will be analysed from a legal perspective that will not exclusively pass from national law but that will include an extensive reference to the proliferating EU legislation on the matter.

II. GREENWASHING IN THE REAL ESTATE SECTOR

When discussing about greenwashing in the real estate sector, it is necessary to start from understanding what is meant as a 'green building'. In this respect, the World Green Building Council comes to rescue as it defined that a building can be identified as green when, 'Its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment; preserve precious natural resources and improve our quality of life.'¹⁸ Therefore, real estate greenwashing typically refers to a situation in which a constructor, developer or real estate agent deceives potential buyers and investors by making false claims regarding environmental characteristics of a building or construction.

A recent study has shown that developers frequently advertise housing estates referring to greenery or nature-based solutions as, for example, recreational infrastructure, green roofs, rain gardens and facilities incentivising nature-based outdoor activities.¹⁹ Researchers found that most advertisements contain descriptions of green spaces in the neighbourhood (garden, park, forest) or emphasised greenery in the real estate itself.²⁰ References to greenery are also extensively applied in graphic designs (i.e., visual presentations) and the names of projects as, for instance, 'Rose Garden', 'Jasmin estate' or 'Evergreen'.²¹ This marketing approach is not surprising taking into consideration that people are willing to pay more for properties located in the proximity of green areas and the recent COVID-19 pandemic has boosted this trend as the European population has experienced several months of 'lockdown' in their own houses, enhancing the need for larger and greener spaces. However, in many

cases, promotional materials depicting the pleasant view of nature and greenery around the building can be identified as greenwashing since environmental claims do not reflect the reality or are completely exaggerated. This implies that developers are using marketing strategies that are supposed to create an image of being sustainably responsible without really delivering good environmental performance.

During the pandemic, carbon dioxide (CO₂) emissions stemming from real estate sector significantly dropped due to lockdowns involving closedown of workplaces, decrease in demand for construction as well as shortages in materials and workforce. However, activities in real estate market rebounded in 2021 to reach pre-pandemic levels showing that important reductions in CO₂ emissions were a pandemic-related peculiarity rather than a permanent change in trend. Despite some progress, this was confirmed in a recent report by the United Nations Environment Programme (UNEP)²² that emphasised how there is no systemic change in this sector that would allow the Paris Agreement²³ goals to be achieved because 'decarbonisation efforts and energy efficiency improvements are being outpaced by the increase of extreme weather conditions, rapidly expanding floor area and growth in demand for energy-consuming services'.²⁴ In a similar way, the International Energy Agency (IEA) labelled the sectoral overview of buildings' footprint as 'not on track'.²⁵

III. THE ENVIRONMENTAL IMPACT OF THE REAL ESTATE SECTOR AND RELATED RISKS

In the discussion about the correlation between the real estate sector and the climate, it is useful to make some preliminary considerations. It is necessary to divide the real estate sector in two main groups, residential and the commercial real estate. While the first group, accounting for the '75% of the [EU] total building heritage',²⁶ refers to housing solutions that target individuals or families and that are formed from all kinds of units, such as condominiums, apartments or townhouses; the second group, composing '25% of the total stock in Europe',²⁷ is comprehensive of all those properties that are allocated for business or commercial purposes, such as office buildings, hotels or shopping centres. The two groups answer to different needs and a recent example is given by the post-COVID-19 housing crisis that is impacting many large

17. STATEC, *Le Logement en chiffres* (September 2023) 14, 1 [5], available at: <https://gouvernement.lu/dam-assets/documents/actualites/2023/09-septembre/26-logement-chiffres-statec/logement-en-chiffre-14.pdf>, last accessed 5 May 2024.
18. World Green Building Council, *About green building. The benefits of green buildings* (2018), available at: <https://www.worldgbc.org/benefits-green-buildings>, last accessed 10 March 2023.
19. A. ГАЉЕСКА-DROZDA et al., 'Potential nature-based solutions and greenwashing to generate green spaces: Developers' claims versus reality in new housing offers', 65, *Urban Forestry & Urban Greening*, 2021.
20. *Ibid.*
21. *Ibid.*
22. United Nations Environment Programme, *2022 Global Status Report for Buildings and Construction*, 9 November 2022.
23. The main objectives of the Paris Agreement, adopted at the UN Climate

- Change Conference (COP21) and entered into force in 2016, are holding 'the increase in the global average temperature to well below 2°C above pre-industrial levels [and limiting] the temperature increase to 1.5°C above pre-industrial levels'. See United Nations Climate Change, *The Paris Agreement. What is the Paris Agreement?*, available at: <https://unfccc.int/process-and-meetings/the-paris-agreement>, last accessed 13 March 2023.
24. See Buildings Performance Institute Europe, *A Paris-Proof retail real estate sector: Taking stock of regulatory and market developments* (2021) available at: https://www.bpie.eu/wp-content/uploads/2021/02/BPIE_Paris-proof-retail-real-estate_Final.pdf, last accessed 15 March 2023.
25. See International Energy Agency, *Buildings*.
26. P. NEGRO, *Technology options for earthquake resistant, eco-efficient buildings in Europe: Research needs*, European Commission, JRC Scientific and Policy Reports, 1 [12], 2014.
27. *Ibid.*, at 13.

LEGITECH

cities worldwide while office spaces are still struggling to be filled due to the post-pandemic trend of working from remote that also carries important environmental perks and this is leading developers to convert office spaces into apartments.

Since office spaces are built for business use and require a peculiar planning of the available space, converting them into apartments is proving challenging and, among those challenges, there are environmental concerns because critical elements, such as energy consumption or heating, are treated differently according to the destination of use. The fact that residential real estate accounts for ¾ of the total building stock in Europe highlights the magnitude of the housing crisis and the need to focus on greenwashing risks that target consumers and investors involved in this specific sector. For example, the 2018 Eurobarometer reported that 58% of Luxembourgish population sees housing as the most important issue faced by the country, while environment, climate and energy issues are a concern only for the 12%.²⁸ This represents an important signal that should make ponder on the detachment between the two problems that, on the contrary, should go hand in hand. This does not in itself denote a lack of interest in the environment, but it could be a potentially dangerous sign that the population is not sufficiently informed or conscious about climate risks and that could, therefore, make choices influenced by greenwashing without being aware of it.

The two above-mentioned groups also involve different value and profitability considerations. While office use, as well as commercial space in shopping centres, is foreseen for sale or rent that brings maximum occupancy of buildings. Residential housing can be rent or purchased for immediate need or as a long-term investment. The quality of residential real estate as an investment product is embedded in it regardless of its use as the value of a property is meant as a safe harbour due to its expected increase in worth over time. This is one of the reasons why many buildings in Luxembourg are either unoccupied or unrented, a dynamic that fuels property price growth and contributes to a prolonged housing crisis.²⁹

Greenwashing risks can be identified both for the real estate as property and for the real estate as an investment product, meaning that deceptive labelling could be the responsibility of owners/developers and/or financial institutions/real estate brokers. However, the sustainability of the growth in value of residential real estate is not only menaced by a potential recession but also by climate change. In fact, extreme weather events can damage buildings generating a loss of value over the investment or the need for the inhabitants to evacuate a property

temporarily or indefinitely, thus increasing their cost of living. Similar circumstances can also affect commercial real estate with businesses that would be unable to continue providing activities or services inside commercial properties, therefore removing important streams of revenue from property owners and managers.

On a different note, the previously mentioned abundance of office space puts owners and developers in competition among them and while this competition could lead to lower prices for renting or buying these spaces, price is not the only element that would lead businesses to make a choice. A business could (and should) orient its choice on the environmental sustainability of a commercial property. In this context, the sustainability is not restricted to the resilience of the property against extreme weather events, but it is especially related to its carbon footprint that includes the total amount of greenhouse gases (GHGs). This means that a business would examine the energy consumption and the emissions of various buildings and, subsequently, it would evaluate its choice not solely based on costs but also according to its own environmental strategy. In such case, greenwashing risks could be observed at different levels. The real estate developer, owner or agent could claim certain environmental standards concerning the buildings for sale or rent, while a business could claim green standards for its products or services by virtue of the sustainability of the building that it would purchase or rent.

This study argues that the real estate sector has a crucial role in the fight against climate change and this claim is justified by its critical carbon footprint. In this respect and along the lines of the division between residential and commercial real estate, it is necessary to make a distinction among the two categories of new *versus* existing buildings. Concerning new buildings, CO₂ emissions stem, among others, from the use of fossil fuels in construction through the use of machinery and from the mining, processing and production of materials, such as cement, steel or aluminium. Whereas for existing buildings the emissions are the result of the use of energy (i.e., electricity and heating/cooling systems), the consumption of water and the disposal of waste throughout their existence. Data published by the IEA has shown that in 2021, the operation of buildings accounted for 30% of global final energy consumption and 27% of the total CO₂ emissions.³⁰ Therefore, reducing emissions in the real estate sector can play a crucial role in helping economies to deliver emissions cuts and achieve a smooth transition to a cleaner economy. The decarbonisation of building materials, the use of sustainable materials, the improvement of existing building efficiency and the construction of new high-performance buildings are just a few of the examples of how

28. European Commission, *Standard Eurobarometer 89*, Spring 2018, available at: <https://europa.eu/eurobarometer/api/deliverable/download/file?deliverableId=66409>, last accessed 5 June 2023.

29. G. ARELLANO, 'Up to 20,000 empty homes estimated to be in Luxem-

bourg's housing stock', *RTL Today*, 28 May 2023, available at: <https://today.rtl.lu/news/luxembourg/a/2067705.html>, last accessed 10 June 2023.

30. International Energy Agency, *Buildings*, September 2022, available at: <https://www.iea.org/reports/buildings>, last accessed 20 June 2023.

the real estate industry can include sustainability into their activities to achieve environmental objectives.

However, a large share of the European building stock,³¹ including that of Luxembourg,³² is old and was built at times in which energy performance was not regulated due to a generalised focus on the well-being of the population influenced by the post-World War II (WWII) economic boom and the improvement of living conditions that had absolute precedence over other needs or objectives.³³ In fact, in Luxembourg the first legislation on the energy performance of buildings was adopted in 1993,³⁴ while the largest share of the Luxembourg's building stock was built between 1946 and 1970 and the stock dating from the early 1900s until 1970 accounts for over the 75% of the total stock, making Luxembourg as one of the MS with the oldest buildings in the EU.³⁵ This entails that the highest majority of Luxembourg's buildings have been built well ahead of the first law regulating energy performance, meaning that, in principle, their exposure to over-consumption and climate related-risks can be considered extremely high.

The age of a country's building stock is considered by researchers as one of 'most effective ways to understand the energy performance of buildings'.³⁶ Therefore, by transposing the above data on Luxembourg's building stock age, it is possible to deduce that the highest majority of Luxembourg's buildings are severely underperforming in terms of energy performance and that is the direct consequence of a considerable low rate of renovations. This problem is not limited to Luxembourg, but it is shared by most EU MS and it is best explained through building codes. Building codes can be described as a set of rules and/or standards that 'govern' the specificities that have to be followed when erecting new buildings. Frequently these building codes refer to aspects that are under the umbrella of energy efficiency, such as insulation, sealing or the sustainability of materials.

Considering that building codes with standards on thermal insulation of buildings were adopted in Europe in the 1970s and taking into account the above data concerning the average age of the building stock, it is possible to conclude that a considerable share of EU's building stock

is energy insufficient according to current standards.³⁷ Moreover, building codes do not keep the path of technological innovation. For example, Luxembourg's latest building code dates back to 2017, even though its latest updates as from the end of 2019.³⁸ Hence it would be preferable for those codes to be updated at more regular intervals. Moreover, recent geopolitical developments caused by the ongoing war in Ukraine that unleashed an energy crisis in the EU and that contributed to boosting existing inflationary pressures present new challenges for the building sector. On the one hand, high energy costs create strong incentives to improve energy efficiency that imply deviating from exploiting fossil fuels for heating and cooling or using old technologies and uneconomical appliances. On the other hand, increasing costs of materials driven by inflation are slowing down investments. As a result, consumers and companies seek to lower costs when choosing sustainable alternatives, an approach that makes them prone to greenwashing risks.

The renovation of the building stock is pivotal for reducing energy consumption. However, research has shown that investments devoted for renovation are still negligible and most of the renovation projects are small or, at best, moderate. Examples of these projects include the installation of new condensing boilers or the insulation of parts of buildings, such as roofs.³⁹ Current efforts are still insufficient as the European Commission observed that, for the period 2012-2016, the annual reduction of the total building stock's primary consumption amounted to 1%.⁴⁰ As for Luxembourg, in the same period, the energy-related renovations of residential buildings were the 7% of the total stock, while the non-energy-related renovations were the 9%.⁴¹ This is an extremely low rate for a country with the highest⁴² gross domestic product per capita expressed in purchasing power standards in the whole EU that, in 2021, was at 168% 'above the EU average'⁴³ and with dampness damages in buildings for 17% of Luxembourg's population.⁴⁴ Small-scale renovations with little primary energy savings per intervention still dominate the market and large-scale deep modernisation projects occur only sporadically.⁴⁵ That is why the European Commission issued a communication in 2020 aimed at providing new impetus to renovation of buildings that is seen as an essential component to achieve EU's climate targets and

31. P. NEGRO, *Technology options for earthquake resistant, eco-efficient buildings in Europe: Research needs*, 1 [15].

32. *Ibid.*

33. For a concise analysis on the post-WWII economic development in Luxembourg, see P. PÉPORTÉ, *About... the History of Luxembourg*, 1 [29], Information and Press Service of the Luxembourg Government, Luxembourg 2022.

34. *Loi du 5 août 1993 concernant l'utilisation rationnelle de l'Énergie*.

35. P. NEGRO, *Technology options for earthquake resistant, eco-efficient buildings in Europe: Research needs*, 1 [15].

36. F. FILIPPIDOU and J. P. JIMÉNEZ NAVARRO, *Achieving the cost-effective energy transformation of Europe's buildings*, European Commission, JRC Technical Report, 1 [8].

37. *Ibid.*

38. See International Energy Agency, *Luxembourg Building Code (2017 update)*, last updated 3 October 2019, available at: <https://www.iea.org/policies/8648-luxembourg-building-code-2017-update>, last accessed 15 May 2023.

39. See F. FILIPPIDOU and J. P. JIMÉNEZ NAVARRO, *Achieving the cost-effective energy transformation of Europe's buildings*. See: European Commission,

Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU (2019).

40. See European Commission, *Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU: final report* (Publications Office of the European Union, Luxembourg 2019).

41. European Commission, *Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU: final report*, 1 [159].

42. Together with Ireland.

43. Eurostat, *Purchasing power parities (PPPs), price-level indices and real expenditures for ESA 2010 aggregates*, available at: https://ec.europa.eu/eurostat/databrowser/view/PRC_PPP_IND_custom_1039745/bookmark/table?lang=en&bookmarkId=9dc46871-f567-46f1-af55-b27cfb6782b7, last accessed 10 April 2023.

44. European Commission, *Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU: final report*, 1 [158].

45. *Ibid.*

LEGITECH

acknowledging that the real estate is one of those sectors in which 'efforts must be ramped up'.⁴⁶

IV. ENVIRONMENTAL, SOCIAL AND GOVERNANCE STANDARDS IN THE REAL ESTATE SECTOR

Environmental standards are part of a broader effort that also includes social and governance aspects, and the ensemble of these factors is labelled as 'ESG'. This acronym encloses the qualification of an economic activity as sustainable. For example, when referring to investment products, the ESG label denotes an investment in which environmental objectives need to favour less energy-intensive production processes; the social factor refers to the well-being of the community; and the corporate governance factor concerns the compliance with diversity policies or the presence of independent directors. These sustainability considerations are an ever-growing focus for the real estate sector, meaning that companies or investment products using the ESG label are, in principle, committed to strategies and practices in line with those factors. In the real estate sector, environmental considerations include efficiency objectives in the consumption of energy and water or enhanced resilience to climate-related risks, such as flooding. Social aspects focus instead on the impact of buildings on society and refer to aspects, such as rehabilitation of public spaces, affordable housing, frictionless (no-contact) building access and support for local enterprises. Governance considerations are associated with companies' management structure and include, for example, diversity, transparency, and inclusion that apply to most firms and that do not have specificities that apply exclusively to the real estate sector.

These factors that belong to the ESG ecosystem are not a problem *per se* but an opportunity. In fact, following the growing consumer attention towards sustainability, companies are increasingly including and advertising products and services that recall these standards or that are accompanied by the acronym ESG. In theory, this would suggest that the attention of companies is veering towards more equitable and sustainable principles, thus no longer limited to pure profit and market trends. However, the problem arises when these claims do not correspond to the objectives inherent to the ESG, constituting a mere advertising operation that attracts consumers without offering them what is expected. This is another perspective of the greenwashing problem from a broader angle that, in addition to the 'E' also considers the other two factors (i.e., 'SG'). As a result, governments and supranational authorities are mandating companies to disclose information on how

their products or services meet these sustainability factors, as it will be analysed below in section IX.

In the same way as for the assessment of the sustainability of investment products or government bonds, the respect of sustainability standards for buildings is evaluated by virtue of the work of rating agencies and each agency has set its own methodology. The world's most important methodologies are the Building Research Establishment Environmental Assessment Method (BREEAM)⁴⁷ developed in the United Kingdom by a former governmental organisation called Building Research Establishment; the Leadership in Energy and Environmental Design (LEED)⁴⁸ developed by the United States Green Building Council and the Comprehensive Assessment System for Built Environment Efficiency (CASBEE)⁴⁹ developed in Japan by a research committee, the Japan Sustainable Building Consortium. Another standard (marginally) deployed in Luxembourg is developed by the International WELL Building Institute. This certification, called WELL Building Standard,⁵⁰ shares with the LEED the same third-party supervision of the Green Building Certification Institute.

For several years, EU MS struggled to find a common methodology, and this led to a multitude of national initiatives and to the overreliance on the above-mentioned third-country standards. In fact, Luxembourg introduced its own scheme in 2017 called *Lëtzebuurger Nohaltegekeets-Zertifizéierung* (LENOZ – Luxembourg sustainability certification).⁵¹ The peculiarities of LENOZ are its optionality, the focus on the residential real estate sector and the possibility of financial support provided by the *ministère du Logement* (i.e., the Luxembourg Ministry of Housing). In order to provide some sort of harmonisation among the various methodologies and standards, the European Commission established the Level(s), in the same year as the LENOZ, as 'a common language for assessing and reporting on the sustainability performance of buildings'.⁵²

Disclosure requirements should be seen as tackling greenwashing without limiting the growth of the ESG phenomenon. In this respect, a recent survey conducted by CBRE targeting over 500 commercial real estate professionals revealed that increasing energy prices and, therefore, rising operating costs together with ESG disclosure requirements are among the primary reasons for the intensified focus of real estate companies on ESG goals in 2022.⁵³ However, among the various sustainability domains, environmental considerations are the most discussed and assessed. For instance, when referring to sustainable international ratings for the real estate sector, such as

46. European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions: 'A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives'*, COM(2020) 662 final, 14 October 2020.

47. See <https://bregroup.com/products/breem/>.

48. See <https://www.usgbc.org/leed>.

49. See <https://www.ibec.or.jp/CASBEE/english/basicconceptE.htm>.

50. See <https://v2.wellcertified.com/en/wellv2/overview>.

51. See [Guichet.lu](https://guichet.lu), *LENOZ certificate*, available at: <https://guichet.public.lu/>

en/entreprises/urbanisme-environnement/energie/energie/certificat-lenoz.html, last accessed 22 April 2023.

52. European Commission, *Level(s): European framework for sustainable buildings*, available at: https://environment.ec.europa.eu/topics/circular-economy/levels_en, last accessed 18 April 2023.

53. CBRE Research, *Strengthening Value Through ESG*, Survey of Global Property Professionals, February 2023, available at: https://www.cbre.com/-/media/project/cbre/shared-site/insights/books/2023-book-media-folder/esg-value-drivers-revealed-media-folder/2022_global_esg_survey.pdf, last accessed 28 March 2023.

the BREEAM, the LEED, the CASBEE and the Level(s), it can be observed that they mostly focus on environmental aspects and fail to consider social and governance aspects. Moreover, environmental-related certifications and standards have been established for the first time in the 1990s (BREEAM was the first one) and are proliferating all over the world,⁵⁴ while those concerning social and governance factors are still recent and underdeveloped. Researchers provided an analysis of several of the most widely used sustainability methodologies in the building sector,⁵⁵ such as those mentioned in the present paragraph, and found that they focus predominantly on energy performance, waste management, materials, and water. To a lesser extent they also consider other factors, such as the resistance against natural disasters, earthquake prevention and olfactory comfort.

V. THE EU ENGAGEMENT FOR THE SUSTAINABILITY OF THE LUXEMBOURG REAL ESTATE SECTOR

The EU regulatory framework—alongside numerous financial incentives—supports transition towards a sustainable economy and steers the flow of capital into environmentally and socially sustainable projects. For instance, around one third of the Next Generation EU (NGEU) is going to be disbursed for green projects. The NGEU is a recent programme put in place by the European Commission to address the consequences of the pandemic. In May 2020, the European Commission proposed a stimulus package backed by the EU's 2021–2027 long-term budget (i.e., the Multiannual Financial Framework)—to date, the biggest package deployed at the supranational level to support the recovery and to ensure the resilience of EU MS against future challenges. In fact, through the NGEU, the EU wants to support broader goals, such as the transition towards a green and digitalised Union. As a result, EU MS prepared National Recovery and Resilience Plans (NRRPs), negotiated with the European Commission, aimed at obtaining the NGEU funding raised and allocated via the Recovery and Resilience Facility.⁵⁶

In this respect, Luxembourg's NRRP set ambitious climate targets as '61% of the plan will support climate objectives'.⁵⁷ Although Luxembourg is not reliant on EU funding as much as Italy or Spain, the NGEU offers a unique opportunity for reform and to channel investments

towards climate-related objectives and the most imperative among them is the reduction of GHG emissions resulting from the building sector. Luxembourg is one of the EU's highest GHG emitters⁵⁸ 'despite a relatively less carbon-intensive economy',⁵⁹ meaning that it requires important efforts to achieve the transition to a sustainable economy. In fact, the real estate sector is expected to grow due to the expanding population and the NGEU will contribute to financing 'a new housing district with heat and electricity produced from renewable energy sources'⁶⁰ and to deliver affordable housing by incentivising the renovation of existing buildings. In light of the data analysed in section III that showed an 'aged' Luxembourg building stock, the second project could represent a game changer to boost the improvement of the energy efficiency of existing residential units. However, programmes as the NGEU imply a massive inflow of resources and several public-private partnerships that could be severely exposed to greenwashing if the government will not take sufficient safeguards to shield strategic investments against this phenomenon.

VI. THE EUROPEAN GREEN DEAL AND THE RENOVATION WAVE

The European Green Deal is the supranational response to climate-related challenges and sets out the strategy for the transition towards greater social inclusion as well as resource-efficient economy that is also climate-neutral, climate-resilient and circular.⁶¹ This strategy aimed to ensure sustainable and inclusive growth with the ultimate objective of achieving climate neutrality by 2050, this means that to deliver the European Green Deal, all actions and policies undertaken at the level of the EU have to be adapted to contribute to sustainability objectives.

As far as the real estate sector is concerned, the European Green Deal called for a 'renovation wave'⁶² of public and private buildings to ensure their energy efficiency and affordability since renovation lowers energy bills and can reduce energy poverty.⁶³ In this respect, it must be stressed that studies reported in previous sections have shown that the rate of energy renovation of buildings is very low and that the renovations that are prevailing in the market are characterised by small-scale projects. In light of the above concerns, the renovation wave sets a twofold

54. See World Green Building Council, *Sustainable Building Certifications*, available at: <https://worldgbc.org/sustainable-building-certifications/>, last accessed 16 April 2023.

55. See D. T. DOAN et al., 'A critical comparison of green building rating systems', 123, *Building and Environment*, 2017, and E. Bernardi et al., 'An Analysis of the Most Adopted Rating Systems for Assessing the Environmental Impact of Buildings', 9(7) *Sustainability*, 2017.

56. Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility [2021] OJ L57/17.

57. See European Commission, *Luxembourg's recovery and resilience plan*, available at: https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/luxembourg-recovery-and-resilience-plan_en, last accessed 23 May 2023. For the full plan, see Ministère des Finances, *Plan pour la reprise et la résilience du Grand-Duché de Luxembourg*, June 2021, available at: https://commission.europa.eu/system/files/2021-07/recovery_and_resilience_plan_for_luxembourg_fr.pdf, last accessed 12 May 2023.

58. See L. JENSEN, *Climate action in Luxembourg: Latest state of play*, June 2021, Briefing, European Parliamentary Research Service, PE 690.664.

59. European Commission, *Luxembourg's recovery and resilience plan*.

60. European Commission, *Luxembourg's recovery and resilience plan*.

61. European Commission, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal*, COM(2019) 640 final, 11 December 2019.

62. European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: 'A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives'*.

63. European Commission, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal*.

objective: it seeks first, to at least double the annual energy renovation rate of residential and non-residential buildings by 2030; and second, to boost deep energy renovations.⁶⁴ For this purpose, the European Commission proposed a series of legislative and financial measures, including the introduction of mandatory minimum energy performance standards in the framework of the revision of the Energy Performance of Buildings Directive (i.e., the EPBD III)⁶⁵ and the revision of the Energy Efficiency Directive (i.e., the EED).⁶⁶

VII. THE REVISION OF THE EPBD III AND EED

In December 2021, the European Commission proposed a revision of the EPBD III that, once adopted will become the EPBD IV,⁶⁷ *de facto* recasting the whole Directive and providing a broad range of policies and measures to modernise the EU's existing building stock and to ensure a high-quality for new constructions. To set off the modernisation of the worst-performing buildings and to increase the rate of renovation, the European Commission foresaw a gradual introduction of minimum energy performance standards. For example, non-residential buildings with energy performance certificate of class 'G' (i.e., the lowest class) must be renovated to reach at least class 'F' by 2027 at the latest and to reach class 'E' by 2030 at the latest. For what concerns residential buildings, the worst-performing (i.e., class 'G') must reach at least class 'F' by 2030 and class 'E' by 2033 at the latest.⁶⁸ Additionally, the proposed EPBD IV advances the introduction of voluntary renovation passports with a step-by-step roadmap for buildings to become Net-Zero buildings by 2050.

As of 2021, according to the legislation currently in force (i.e., EPBD III), all new private buildings must be Nearly Zero-Energy Buildings (NZEBs) while public buildings needed to follow the NZEB strategy from 2019. In line with Article 2(2) of the latter Directive, NZEB refers to a building that has a very high energy performance. This means that the very low amount of energy required should be covered in majority by energy from renewable sources, such as wind and solar. The EPBD IV goes a step further and foresees that new buildings must be Zero-Emission Buildings (ZEBs) starting from 2030. As for NZEB, Article 2(2) of the EPBD provides a definition of ZEB as a building with a very high energy performance and in which the very low amount of energy still required is fully covered by energy from renewable sources

generated on-site, meaning from a renewable energy community or from a district heating and cooling system. According to the EPBD IV, buildings occupied or owned by the public authorities must be zero emission as of 2027. In line with the proposed amendments, new buildings need to be adapted to climate change and to risks related to intense seismic activity. Moreover, they should incorporate healthy indoor climate conditions and ensure accessibility for persons with disabilities. While the final version of the EPBD IV has not yet been published, there is no doubt that to meet new and ambitious requirements, stakeholders of the real estate sector will have to engage in drastic changes to achieve the above objectives. In this sense, when companies have to deal with high compliance costs, the risk of greenwashing is even higher since firms would need to show the achievement of certain objectives to 'survive' in an extreme competitive environment characterised by high costs that do not stem only from compliance with the above legislation, but that include current inflationary pressures, supply chain bottlenecks, and shortages of materials.

In July 2021, the European Commission published its proposal for recasting the EED with new (higher) targets for reducing EU primary and final energy consumption by 2030.⁶⁹ In light of the recent energy crisis, the proposal also increases the annual energy saving obligation for EU MS to 1.5% compared to 0.8% under the current EED in force. While setting a new framework to promote energy efficiency, the proposal also focuses on energy-intensive sectors, such as the real estate. In the real estate sector efforts are needed to reduce energy use for heating and cooling that account for 80% of the total energy use. The recast EED emphasises the need for energy efficiency of buildings used by the public sector that is expected to lead by example.⁷⁰

VIII. LUXEMBOURG'S ENERGY PERFORMANCE STRATEGY

Luxembourg has implemented the above EU legislation within the law on the rational use of energy of 1993 and subsequent amendments.⁷¹ This law is not limited to set measures concerning energy efficiency, but it also includes objectives in terms of renewable energy, since the country is severely dependent on fossil fuels. As for the part on energy efficiency, property owners are required to undertake evaluation of the energy performance of their buildings and to improve their efficiency by working on insulation, heating and/or cooling.⁷²

64. European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions: 'A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives'*.

65. Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast) [2010] OJ L153/13.

66. Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC [2012] OJ L315/1.

67. European Commission, *Proposal for a directive of the European Parliament and of the Council on the energy performance of buildings (recast)*, COM/2021/802 final, 15 December 2021.

68. European Commission, *Proposal for a directive of the European Parlia-*

ment and of the Council on the energy performance of buildings (recast), COM/2021/802 final, 15 December 2021, 1 [13-14].

69. European Commission, *Proposal for a directive of the European Parliament and of the Council on energy efficiency (recast)*, COM/2021/558 final, 14 July 2021.

70. See Art 6 of the proposed recast EED.

71. See, for example, *Concerted Action of the Energy Efficiency Directive, EED implementation in Luxembourg*, July 2016, available at: https://www.ca-eed.eu/ia_document/national-implementation-report-2016-luxembourg/, last accessed 18 May 2023.

72. International Energy Agency, *Framework Law concerning rational use of energy: Law of 5 August 1993*, 24 August 2021, available at: <https://www.iea.org/policies/2078-framework-law-concerning-rational-use-of-energy-law-of-5-august-1993>, last accessed 18 May 2023.

The amendments brought by the EU legislation on the matter have increased the requirements for obtaining a building permit in Luxembourg. As for residential buildings, there will be essentially two classes of energy requirements referring to the energy performance and the thermal insulation respectively. The foreseen methodology points at buildings that have an energy performance class 'A' (i.e., the highest class) that corresponds to NZEB for Luxembourg, thus being in line with the requirements of EPBD III. Due to the composition of its building stock, Luxembourg dedicates more attention to the residential real estate, and it calculates the requirements for new buildings out of a methodology based on the comparison with a reference building and no longer being dependent on elements, such as cubature or location. In this way, the decarbonisation of the sector passes through the extent to which these requirements are ambitious.

For example, starting from 2023, gas condensing boiler has been replaced by an air source heat pump in reference buildings. Even though fossil fuels are not forbidden in Luxembourg as the energy source of new buildings, they are highly unlikely to reach the energy performance required for obtaining the building permit without including a heat pump. In theory, this should influence developers and constructors to switch to alternative and more sustainable solutions. The strictness of this regime can also serve as a way to tackle greenwashing as the latter categories of operators of the real estate sector would have less leverage in terms of the claims of the sustainability of their buildings.

IX. THE EU REGULATORY WAVE FOR SUSTAINABLE FINANCE IN THE REAL ESTATE SECTOR: THE TAXONOMY REGULATION AND THE SUSTAINABLE FINANCE DISCLOSURE REGULATION

The sustainability of real estate is not limited to regulations and guidelines that tackle new or existing buildings, their energy efficiency, and the related economic activities. To achieve the transition to a sustainable economy, it is necessary that real estate as an investment product is treated by banking and financial institutions according to sustainability standards. In this sense, sustainable finance can play a critical role in channelling capital flows to products and services that embed environmental objectives. However, the risk of greenwashing in this respect is considerable since those institutions could promote green investment products while instead using the funds of their customers to purchase assets of 'brown' companies and failing or avoiding to correctly disclose their portfolios.

In March 2018, the European Commission published its action plan to set the EU strategy for sustainable finance, thus aiming at reorienting capital flows towards sustainable investments.⁷³ This action plan pointed out to the need to develop a clear classification system determining the economic activities that qualify as sustainable. This would bring transparency and clarity for the companies as well as provide a reference framework for investors. Considering the complexity and the highly technical nature for the establishment of this classification system, the European Commission opted to focus in the first place on environmental considerations, such as climate change mitigation and adaptation activities. At a later stage, the European Commission will provide guidance regarding social aspects and residual environmental considerations that were not covered from the outset.

Following the action plan, the Taxonomy Regulation was adopted in 2020.⁷⁴ This Regulation applies to both residential and non-residential real estate and encompasses activities that range from the construction of new buildings through the renovation of existing buildings in terms of major renovations. To be classified as environmentally sustainable, an economic activity must contribute substantially to one or more of the objectives set in the Regulation, such as climate change mitigation and adaptation; sustainable use and protection of water and marine resources; transition to a circular economy; pollution prevention and control; and protection and restoration of biodiversity and ecosystems.⁷⁵

At the same time, these activities must comply with technical screening criteria and cannot significantly harm other objectives, meaning that they need to follow the 'Do No Significant Harm' (DNSH) principle.⁷⁶ It must be highlighted that the DNSH principles apply to all the projects financed under the NGEU, meaning that the real estate projects foreseen in the Luxembourg NRRP have to be compliant with this principle. Moreover, the above activities should comply with certain 'minimum safeguards', such as those contained in the UN Guiding Principles on Business and Human Rights.⁷⁷ Among these principles, it can be mentioned the fact that the real estate project or activity should not have a negative social impact.

Having set the requirements for identifying sustainable constructions and renovations, it was necessary to address potential greenwashing risks by putting in place a framework that would ensure sufficient transparency and monitoring. These were the objectives that inspired the EU legislator when it adopted the Sustainable Finance Disclosure Regulation (SFDR)⁷⁸ targeting financial

73. European Commission, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: Action Plan: Financing Sustainable Growth*, COM(2018) 97 final, 8 March 2018.

74. Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088 [2020] OJ L198/13.

75. See Article 9 of the Taxonomy Regulation.

76. J. GUPTA and S. SCHMEIER, 'Future proofing the principle of no significant

harm' (2020) 20 *International Environmental Agreements: Politics, Law and Economics*.

77. United Nations Human Rights, *Guiding Principles on Business and Human Rights* (2011) available at: https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf, last accessed 22 May 2023.

78. Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector [2019] OJ L317/1.

LEGITECH

market participants. In this way, the EU wanted to make sure that companies disclose sustainability-related information of their investment products and that investors can make more conscious choices. By virtue of the SFDR, investors can make informed choices when investing into projects that claim environmental objectives and, in addition, they are able to assess the sustainability risks embedded in their investments. As a result, private funding is channelled into green projects while diminishing the risk of greenwashing.

This argument is not only supported by the objectives of the EU legislation, but studies have shown that mandatory reporting mitigates greenwashing while incentivising companies to make real efforts to improve their environmental performance. In this respect, Grewal and al. provided empirical evidence that mandatory ESG reporting reduces selective disclosure,⁷⁹ that is a core element of greenwashing.⁸⁰ In the absence of requirements for companies to disclose elements, such as GHG emissions, companies tend to emphasise favourable information and withhold unpropitious information, thus obscuring the reality about the environmental impact of their products or activities. In a similar fashion Downar et al. have shown that mandatory reporting entails a real GHG reduction effect, meaning that companies that need to report their carbon footprint make real efforts to reduce their emissions.⁸¹ As companies are limited to engage into selective disclosure, the prospect of reputational damage has a positive impact on the behaviour of companies in terms of the trustworthiness of their sustainability objectives.

X. THE SUPRANATIONAL BATTLE AGAINST GREENWASHING: THE PROPOSALS FOR A GREEN CLAIMS DIRECTIVE AND A GREENWASHING DIRECTIVE

The analysis made in this article has shown that broad and ambitious regulatory efforts are not sufficient to help Luxembourg (and the EU) to achieve a green transition for the real estate sector. Apart from impediments related to the unpredictable economic and geopolitical environment, rising costs and the lack of funding, it was possible to observe that sustainability objectives for the real estate sector are endangered by the phenomenon of greenwashing. After several years in which researchers and non-governmental organisations have been flagging this problem, the European Commission has decided to get tougher and tackle this phenomenon by means of two recent legislative proposals, the proposal for a Green Claims Directive and a Greenwashing Directive.

The above directives are part of the broader framework of the European Green Deal and aim at protecting consumers while promoting a sustainable and circular economy. The Greenwashing Directive got an overwhelmed support at the EU level, showing the urgency of the matter and, similarly to the SFDR, it aims at empowering consumers to make better informed choices by averting the risk of greenwashing and especially targeting all the buzzwords mentioned in the introduction that recall environmental objectives. This proposal addresses both consumers and companies as it does not exclusively aim to prevent greenwashing but also to promote and orient environmentally friendly choices by consumers and investments by companies respectively.

In this sense, climate risk should be seen as an opportunity for the real estate sector. While decarbonising real estate portfolios could lead to devaluation, in the long term this should be future-proof those portfolios, enhancing resilience and protecting from future shocks. In this respect, committing to the Net Zero is not sufficient, it is necessary that portfolios clearly follow such objective but redirecting investments or repricing them according to their actual degree of sustainability risk. Governments and central banks may have a role in this respect by assigning premiums to green bonds, loans and mortgages facilitating their distribution in the financial markets. In any case, financial markets have demonstrated that there is a high appetite for this kind of investment products and Luxembourg is playing a pioneering and leading role in the industry as its stock exchange has issued the first even green bond on behalf of the European Investment Bank.⁸² However, this boost for green financing should be accompanied by the necessary disclosure and monitored to avoid that billions of euros are poured into investments, including those focusing on the real estate sector, that do not actually entail the environmental objectives that they promote, thus misleading investors.

XI. THE LUXEMBOURG APPROACH AND WAY FORWARD

Luxembourg can be considered one of the EU MS that are at the forefront of the race for the achievement of the sustainability of the real estate sector. In this respect, it has been one of the first countries to implement the NZEB standards for all new constructions already in 2017, that is three years ahead of other EU countries. However, due to the positive economic outlook and the peculiar setting of its building stock, as described above, the real estate sector is a source of systemic risk in Luxembourg as warned by the ESRB.⁸³ This risk has the potential to

79. J. GREWAL et al., *Effects of Mandatory Carbon Reporting on Unrepresentative Environmental Disclosures* (2022) available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4166184, last accessed 25 May 2023.

80. S. V. DE FREITAS NETTO et al., 'Concepts and forms of greenwashing: A systematic review', 1 [6].

81. See B. DOWNAR et al., 'The impact of carbon disclosure mandates on emissions and financial operating performance', 26, *Review of Accounting Studies*, 2021.

82. Luxembourg Stock Exchange, *A pioneer in green finance*, available at: <https://www.bourse.lu/luxse-the-home-of-green-bonds#:~:text=In%202007%2C%20LuxSE%20listed%20the,bonds%20list%20on%20our%20markets>, last accessed 16 March 2023.

83. See European Systemic Risk Board, *Follow-up report on vulnerabilities in the residential real estate sectors of the EEA countries*, February 2024, 1 [55-57], available at: <https://www.esrb.europa.eu/pub/pdf/reports/esrb.report.vulnerabilitiesresidentialrealestatectors202402-df77b00f9a.en.pdf>, last accessed 28 March 2024.

expand in the near future as a result of the high interest rate environment that puts pressures on the repayment of loans and the tightening of financial conditions that can lead to a credit crunch that could severely impact the whole real estate sector.

In light of the above, it is possible to observe that Luxembourg is more engaged in green (and ESG) objectives and strategies with regards to real estate as an investment product than to real estate as a sector. Notwithstanding the presence of *ad hoc* rules that govern sustainability standards for the real estate sector and that concern both new and existing buildings with a particular attention towards the residential real estate, Luxembourg does not appear to proceed to tackle greenwashing on its own but to follow the initiatives of the European Commission at the supranational level. In fact, while it should be acknowledged the presence of some organisations in Luxembourg that can help to integrate environmental objectives into existing portfolios,⁸⁴ meaning an operation that facilitates the prevention of greenwashing practices, it represents another example of steps forward for the Luxembourg investment industry but not for its real estate industry.

In this respect, at least for what concerns energy sources, Luxembourg has shown to take a harder stance than other EU MS on what should be considered as a sustainable product. In fact, together with Austria, it has expressed concerns for the willingness of the European Commission to include gas and nuclear in the Taxonomy.⁸⁵ Although this does not strictly concern real estate, the inclusion of these sources can have a significant impact over the carbon footprint of the entire real estate production chain given the highly energy-intensive nature of real estate construction and renovation activities. At the same time, these energy sources have an impact on European consumers' choices regarding their electricity and heating expenditure.

While Luxembourg has shown decisiveness concerning energy sources to be included in the Taxonomy, it did not show the same behaviour concerning the disclosure about potential risks arising from climate change in the investments made by the Luxembourg's *Fonds de compensation commun au régime général de pension* (FDC), a public pension fund established in 2004 by the Luxembourg government. The denial of the Minister of Social Security

to proceed for this disclosure did not allow activists, such as Greenpeace Luxembourg A.S.B.L. to assess whether FDC's investments were aligned to the Paris Agreement since the FDC claims to be engaged in sustainable investments,⁸⁶ although Greenpeace argued that the FDC invested in fossil fuels, such as carbon or petrol.⁸⁷

As a reaction to the Minister's disclosure denial, Greenpeace challenged it at the administrative court of Luxembourg, asking the court to require the Minister to disclose such information. This first litigation concerning greenwashing in Luxembourg was aimed at allowing not only the association, but also the general public and the subscribers to the FDC to be aware of the fund's investment strategy. On its side, the administrative court decided in favour of the Minister of Social Security. Even though the information asked by Greenpeace was classified by the judge as environmental information falling under Article 3(1) of the Luxembourg law of 25 November 2005 regarding the public's access to environmental information,⁸⁸ the Minister of Social Security was not identified as responsible for deciding upon the investment strategy of the FDC, being limited to a sort of oversight function.⁸⁹ This function did not bind the Minister for disclosing information or ensuring compliance with environmental objectives. As a result, the action brought by Greenpeace was dismissed.

This first case law aimed at tackling greenwashing might pave the way for more legal actions from activists and similar associations towards financial institutions, asset managers or, in any case, companies that claim certain environmental objectives. In fact, the European Central Bank issued a 'Guide on climate-related and environmental risks'⁹⁰ in November 2020 in which it advised banking and financial institutions to protect themselves against the risk of greenwashing that could materialise by means of reputational risk or the risk for an institution to be held liable for false or misleading claims concerning environmental objectives, services or products. Those risks apply as well to developers, real estate agencies or brokers, but also public institutions can be the target of litigation concerning greenwashing. In this context, it should also be mentioned the current effort led by the European Supervisory Authorities, such as the European Banking Authority (EBA)⁹¹ or the European Securities and Markets Authority, to improve the understanding of greenwashing in

84. The Luxembourg Finance Labelling Agency is an example of organisations supported, among others, by the Luxembourg government that provide this kind of services to banking and financial institutions, asset managers. See The Luxembourg Finance Labelling Agency, available at: <https://luxflag.org/what-we-do/>, last accessed 25 May 2023.

85. K. ABNETT, 'Lawmakers threaten to sue the EU if it labels gas investments as 'green'', *Reuters*, 1 July 2022, available at: <https://www.reuters.com/business/energy/lawmakers-threaten-sue-eu-if-it-labels-gas-investments-green-2022-07-01/>, last accessed 20 February 2023.

86. See, for example, Fonds de Compensation, *Sustainable investor report 2020*, available at: <https://fdc.public.lu/dam-assets/publications/Sustainable-Investor-Report-2020-final-web-version-.pdf>, last accessed 22 April 2023.

87. See Greenpeace, *Dirty and Dangerous: Through its investments, the Luxembourg pension fund FDC fuels the climate crisis and fails to protect human rights*, 30 March 2022, available at: [https://www.greenpeace.org/luxembourg/fr/actualites/14089/dirty-and-dangerous-through-its-investments-the-luxembourg-pension-fund-fdc-fuels-the-climate-crisis-](https://www.greenpeace.org/luxembourg/fr/actualites/14089/dirty-and-dangerous-through-its-investments-the-luxembourg-pension-fund-fdc-fuels-the-climate-crisis-and-fails-to-protect-human-rights/)

[and-fails-to-protect-human-rights/](https://www.greenpeace.org/luxembourg/fr/actualites/14089/dirty-and-dangerous-through-its-investments-the-luxembourg-pension-fund-fdc-fuels-the-climate-crisis-and-fails-to-protect-human-rights/), last accessed 24 April 2023.

88. Loi du 25 novembre 2005 concernant l'accès du public à l'information en matière d'environnement.

89. Tribunal administratif du Grand-Duché de Luxembourg, *Requête introduite par l'association sans but lucratif GREENPEACE A.S.B.L., Esch-sur-Alzette, contre une décision implicite de refus du ministre de la Sécurité sociale en matière d'accès du public à l'information en matière d'environnement* (art. 6 (4), L.25.11.2005), Audience publique du 17 décembre 2019, n° 43604 du rôle.

90. European Central Bank, *Guide on climate-related and environmental risks*, November 2020, available at: <https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.202011finalguideonclimate-relatedandenvironmentalrisks-58213f6564.en.pdf>, last accessed 29 April 2023.

91. In its recent roadmap on sustainable finance, the EBA stated that it 'will contribute to the development of green standards and labels, and measures to address emerging risks in this field, such as greenwashing.' See European Banking Authority, *The EBA publishes its roadmap on sustainable*

LEGITECH

banking and financial services industries.⁹² It is important to stress that these industries are exposed to the real estate sector and the related greenwashing risks, not only in terms of real estate as financial products but also with regards to 'green' mortgages or loans.⁹³

Since collective action is a driving force for these types of cases, it is useful to highlight the absence of a legal framework in Luxembourg governing class actions and group litigation. However, the draft bill No. 7650 introducing collective recourse procedures in Luxembourg consumer law should enable class actions also concerning greenwashing risks. This draft bill offering collective redress is currently in discussion at the level of parliamentary commissions⁹⁴ and follows the adoption of Directive (EU) 2020/1828,⁹⁵ another sign that it is not the Luxembourg government on its own willing to proceed for introducing class actions, but it is following developments at the level of EU law. Moreover, it should be acknowledged that this draft bill was presented back in August 2020, thus around three years ago. In the meantime, Luxembourg experienced a change in government following the general elections that took place on 8 October 2023. Hence, a new parliament and government will have a say on such legislation.

XII. CONCLUDING REMARKS

This article aimed at providing an overview of greenwashing risks for the real estate sector by focusing on Luxembourg. By virtue of the increasing attention over climate goals and sustainability objectives, the risk that consumers are exposed to false or misleading claims is escalating at alarming levels. Among the various economic activities and services that are exposed to climate risks, the real estate sector seems occupying an offstage seat in comparison to concerns related to other industries, such as those for food and textiles. However, data analysed in this article illustrated that the percentage of GHG emissions and other climate-related risks is extremely concentrated in the real estate sector, meaning that a crucial share of the transition the Net Zero will depend on the achievement of the decarbonisation of this sector.

While this study divided this sector in two groups depending on the destination of use of buildings, it had to concentrate the attention on a specific group, the residential real estate sector, since it counts for ¾ of existing buildings. Within this sector, data on the EU's and, especially, Luxembourg's building stock has shown that the highest majority

of existing buildings have been built well ahead of the first rules and standards concerning the energy efficiency of buildings. On top of that, recent data reinforces the negative message of international organisations, such as the IEA or the UNEP, that distance the possibility of achieving the objectives set by the Paris Agreement since researchers found that renovations are proceeding at a slow pace. This means that the transition to the Net Zero and the achievement of a decarbonised and sustainable economy is far in sight. In this context, greenwashing plays a crucial (negative) role as the efforts that governments, consumers and truly environmentally committed companies are putting towards the achievement of the above objectives are damaged, or even made vain, by the actions or the omissions of companies that use 'green' claims to make profit without clearly making any (or partial) investment towards a true decarbonisation of their activities or services.

Despite this pessimistic picture, it is imperative to adopt a broader perspective, and, in this sense, law comes to aid by providing with solutions to combat this phenomenon. For this purpose, this article analysed the EU legislation on topics, such as green claims, sustainable finance disclosure and greenwashing and the result was then observed in light of the latest objectives that the (former) Luxembourg government has set for the future. While the progress in this sector started very late given the conformation of the existing building stock, thus putting the objectives of the entire system uphill, the same objectives can easily be declared positively ambitious, helping to preserve the hope of their achievement.

However, the eradication, the prevention or, at least, the minimisation of greenwashing for the Luxembourg real estate sector will not exclusively pass through stringent rules and monitoring over the renovation of the existing building stock. Due to the ongoing housing crisis in Luxembourg and the development and growth of the real estate sector, it is imperative to tackle greenwashing risks stemming from the investments in real estate financial products. In this sense, the work of rating agencies and the compliance with EU law and related Luxembourg implementation of disclosure rules can provide investors with more information on the portfolios of banking and financial institutions, including asset managers, thus avoiding the kind of situation experienced at the level of the FDC. In this respect, once Luxembourg will adopt the law that will introduce the possibility for class actions, litigation on greenwashing could drastically increase and the legal

finance, 13 December 2022, available at: https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2022/ESG%20roadmap/1045378/EBA%20Roadmap%20on%20Sustainable%20Finance.pdf, last accessed 29 April 2023.

92. European Supervisory Authorities, *ESAs Call for evidence on better understanding greenwashing*, 25 November 2022, https://www.esma.europa.eu/sites/default/files/library/esas_call_for_evidence_on_greenwashing.pdf, last accessed 30 April 2023.
93. European Commission, *Call for advice to the European Banking Authority on green loans and mortgages*, 22 November 2022, available at: https://www.eba.europa.eu/sites/default/documents/files/document_library/About%20Us/Missions%20and%20tasks/Call%20for%20Advice/2022/

CfA%20on%20green%20loans%20and%20mortgages/1043881/EBA%20Call%20for%20Advice%20Green%20Loans%20and%20Mortgages_Clean.pdf, last accessed 30 April 2023.

94. Chambre des Députés du Grand-Duché de Luxembourg, 7650: *À propos du dossier*, available at: <https://www.chd.lu/fr/dossier/7650>, last accessed 21 June 2023.
95. Directive (EU) 2020/1828 of the European Parliament and of the Council of 25 November 2020 on representative actions for the protection of the collective interests of consumers and repealing Directive 2009/22/EC [2020] OJ L409/1.
96. supported by the Luxembourg National Research Fund (FNR) – 10965388.

framework should prove to be ready to allow consumers, investors, and activists to be aware of the direction in which their money is going in terms of the authenticity of sustainability objectives.

In conclusion, this study has identified a number of green-washing risks for the Luxembourg real estate sector and, while the path for their eradication is certainly complex, the decarbonisation and transition of this sector towards the Net Zero can be considered to be in the right track subject to the pursue of the current attention over this phenomenon and the related legislator and enforcement efforts to be continued both at the EU and the national level. Only by keeping high the bar of the environmentally related pressure over the real estate sector and the financial sector engaged in real estate investment products companies, it is possible to give life to the hope of achieving crucial objectives for the protection of the environment and the survival of the population for future generations in safe environmental conditions.

Pier Mario LUPINU

*Ph.D. in Banking and Finance Law
at the University of Luxembourg
and Università degli Studi Roma Tre.*

Anna MACHURA-URBANIAK

*Doctoral researcher in Banking and Finance Law
at the University of Luxembourg**

BIBLIOGRAPHY

- K. ABNETT, 'Lawmakers threaten to sue EU if it labels gas investments as 'green'', *Reuters*, 1 July 2022, available at: <https://www.reuters.com/business/energy/lawmakers-threaten-sue-eu-if-it-labels-gas-investments-green-2022-07-01/>.
- G. ARELLANO, 'Up to 20,000 empty homes estimated to be in Luxembourg's housing stock', *RTL Today*, 28 May 2023, available at: <https://today.rtl.lu/news/luxembourg/a/2067705.html>.
- K. BECKER-OLSEN, 'Greenwashing' (2013) in S. O. IDOWU, N. CAPALDI, L. ZU, and A. DAS GUPTA (eds), *Encyclopedia of Corporate Social Responsibility* (Springer, Berlin, Germany 2013), pp. 1318-1323.
- E. BERNARDI, S. CARLUCCI, C. CORNARO, and R. A. BOHNE, 'An Analysis of the Most Adopted Rating Systems for Assessing the Environmental Impact of Buildings' (2017) 9(7) *Sustainability*, pp. 1226-1253.
- Buildings Performance Institute Europe, *A Paris-Proof retail real-estate sector: Taking stock of regulatory and market developments* (2021) available at: https://www.bpie.eu/wp-content/uploads/2021/02/BPIE_Paris-proof-retail-real-estate_Final.pdf.
- CBRE Research, *Strengthening Value Through ESG*, Survey of Global Property Professionals, February 2023, available at: https://www.cbre.com/-/media/project/cbre/shared-site/insights/books/2023-book-media-folder/esg-value-drivers-revealed-media-folder/2022-global_esg_survey.pdf.
- Chambre des Députés du Grand-Duché de Luxembourg, 7650: *À propos du dossier*, available at: <https://www.chd.lu/fr/dossier/7650>.
- Concerted Action of the Energy Efficiency Directive, *EED implementation in Luxembourg*, July 2016, available at: https://www.ca-eed.eu/ia_document/national-implementation-report-2016-luxembourg/.
- S. V. DE FREITAS NETTO, M. F. F. SOBRAL, A. R. B. RIBEIRO, and G. R. d. L. SOARES, 'Concepts and forms of greenwashing: A systematic review' (2020) 32(19) *Environmental Sciences Europe*, pp. 1-12.
- D. T. DOAN, A. GHAFFARIANHOSEINI, N. NAISMITH, T. ZHANG, A. GHAFFARIANHOSEINI, and J. TOOKEY, 'A CRITICAL comparison of green building rating systems' (2017) 123 *Building and Environment*, pp. 243-260.
- B. DOWNAR, J. ERNSTBERGER, S. REICHELSTEIN, S. SCHWENEN, and A. ZAKLAN, 'The impact of carbon disclosure mandates on emissions and financial operating performance' (2021) 26 *Review of Accounting Studies*, pp. 1137-1175.

European Banking Authority, *The EBA publishes its roadmap on sustainable finance*, 13 December 2022, available at: https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2022/ESG%20roadmap/1045378/EBA%20Roadmap%20on%20Sustainable%20Finance.pdf.

European Central Bank, *Guide on climate-related and environmental risks*, November 2020, available at: <https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.202011finalguideonclimate-relatedandenvironmentalrisks-58213f6564.en.pdf>.

European Commission, *Call for advice to the European Banking Authority on green loans and mortgages*, 22 November 2022, available at: https://www.eba.europa.eu/sites/default/documents/files/document_library/About%20Us/Missions%20and%20tasks/Call%20for%20Advice/2022/CfA%20on%20green%20loans%20and%20mortgages/1043881/EBA%20Call%20for%20Advice%20Green%20Loans%20and%20Mortgages_Clean.pdf.

European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions: 'A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives'*, COM(2020) 662 final, 14 October 2020.

European Commission, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: Action Plan: Financing Sustainable Growth*, COM(2018) 97 final, 8 March 2018.

European Commission, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal*, COM(2019) 640 final, 11 December 2019.

European Commission, *Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU: final report* (Publications Office of the European Union, Luxembourg 2019).

European Commission, *Europeans' attitudes towards the issue of sustainable consumption and production*, Flash Eurobarometer, April 2009.

European Commission, *Impact Assessment Report Accompanying the document Proposal for a Directive of the European Parliament and of the Council amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and better information*, 30 March 2022, SWD(2022) 85 final.

European Commission, *Level(s): European framework for sustainable buildings*, available at: https://environment.ec.europa.eu/topics/circular-economy/levels_en.

European Commission, *Luxembourg's recovery and resilience plan*, available at: https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/luxembourgs-recovery-and-resilience-plan_en.

European Commission, *Proposal for a Directive of the European Parliament and of the Council amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and better information*, COM/2022/143 final, 30 March 2022.

European Commission, *Proposal for a directive of the European Parliament and of the Council on energy efficiency (recast)*, COM/2021/558 final, 14 July 2021.

European Commission, *Proposal for a Directive on substantiation and communication of explicit environmental claims*, COM (2023) 166 final, 22 March 2023.

European Commission, *Proposal for a directive of the European Parliament and of the Council on the energy performance of buildings (recast)*, COM/2021/802 final, 15 December 2021.

European Commission, *Standard Eurobarometer 89*, Spring 2018, available at: <https://europa.eu/eurobarometer/api/deliverable/download/file?deliverableId=66409>.

European Systemic Risk Board, *Follow-up report on vulnerabilities in the residential real estate sectors of the EEA countries*, February 2024, available at: <https://www.esrb.europa.eu/pub/pdf/reports/esrb.report.vulnerabilitiesresidentialrealestatesectors202402-df77b00f9a.en.pdf>.

European Supervisory Authorities, *ESAs Call for evidence on better understanding greenwashing*, 25 November 2022, https://www.esma.europa.eu/sites/default/files/library/esas_call_for_evidence_on_greenwashing.pdf.

Eurostat, *House prices down, rents up between Q3 and Q4 2023*, 4 April 2024, available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240404-1>.

Eurostat, *Purchasing power parities (PPPs), price level indices and real expenditures for ESA 2010 aggregates*, available at: https://ec.europa.eu/eurostat/databrowser/view/PRC_PPP_IND__custom_1039745/bookmark/table?lang=en&bookmarkId=9dc46871-f567-46f1-af55-b27cfb6782b7.

F. FILIPPIDOU AND J. P. JIMÉNEZ NAVARRO, *Achieving the cost-effective energy transformation of Europe's buildings*, European Commission, JRC Technical Report, pp. 1-50.

Fonds de Compensation, *Sustainable investor report 2020*, available at: <https://fdc.public.lu/dam-assets/publications/Sustainable-Investor-Report-2020-final-web-version.pdf>.

A. GAŁECKA-DROZDA, A. WILKANIEC, M. SZCZEPAŃSKA, and D. ŚWIERK, 'Potential nature-based solutions and greenwashing to generate green spaces: Developers' claims versus reality in new housing offers' (2021) 65 *Urban Forestry & Urban Greening*, 127345.

Greenpeace, *Dirty and Dangerous: Through its investments, the Luxembourg pension fund FDC fuels the climate crisis and fails to protect human rights*, 30 March 2022, available at: <https://www.greenpeace.org/luxembourg/fr/actualites/14089/dirty-and-dangerous-through-its-investments-the-luxembourg-pension-fund-fdc-fuels-the-climate-crisis-and-fails-to-protect-human-rights/>.

J. GREWAL, G. D. RICHARDSON, and J. WANG, *Effects of Mandatory Carbon Reporting on Unrepresentative Environmental Disclosures* (2022) available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4166184.

Guichet.lu, *LENOZ certificate*, available at: <https://guichet.public.lu/en/entreprises/urbanisme-environnement/energie/energie/certificat-lenoz.html>.

J. GUPTA, and S. SCHMEIER, 'Future proofing the principle of no significant harm' (2020) 20 *International Environmental Agreements: Politics, Law and Economics*, pp. 731-747.

International Energy Agency, *Buildings*, September 2022, available at: <https://www.iea.org/reports/buildings>.

International Energy Agency, *Framework Law concerning rational use of energy: Law of 5 August 1993*, 24 August 2021, available at: <https://www.iea.org/policies/2078-framework-law-concerning-rational-use-of-energy-law-of-5-august-1993>.

International Energy Agency, *Luxembourg Building Code (2017 update)*, last updated 3 October 2019, available at: <https://www.iea.org/policies/8648-luxembourg-building-code-2017-update>.

L. JENSEN, *Climate action in Luxembourg: Latest state of play*, June 2021, Briefing, European Parliamentary Research Service, PE 690.664.

Luxembourg Stock Exchange, *A pioneer in green finance*, available at: <https://www.bourse.lu/luxse-the-home-of-green-bonds#:~:text=In%202007%2C%20LuxSE%20listed%20the,bonds%20list%20on%20our%20markets>.

Ch. MARQUIS, M. W. TOFFEL, and Y. ZHOU, 'Scrutiny, Norms, and Selective Disclosure: A Global Study of Greenwashing' (2016) 27(2) *Organization Science*, pp. 483-504.

Ministère des Finances, *Plan pour la reprise et la résilience du Grand-Duché de Luxembourg*, June 2021, available at: https://commission.europa.eu/system/files/2021-07/recovery_and_resilience_plan_for_luxembourg_fr.pdf.

P. NEGRO, *Technology options for earthquake resistant, eco-efficient buildings in Europe: Research needs* (2014) European Commission, JRC Scientific and Policy Reports, pp. 1-108.

E. ORANGE, and A. M. COHEN, 'From eco-friendly to eco-intelligent' (2010) 44(5) *The Futurist*, pp. 28-32.

P. PÉPORTÉ, *About... the History of Luxembourg* (Information and Press Service of the Luxembourg Government, Luxembourg 2022).

D. SILVA, 'The fight against greenwashing in the European Union' (2021) 7(2) *UNIO-EU Law Journal*, pp. 124-137.

STATEC, *Le Logement en chiffres* (September 2023), pp. 1-22, available at: <https://gouvernement.lu/dam-assets/documents/actualites/2023/09-septembre/26-logement-chiffres-statec/logement-en-chiffre-14.pdf>.

The Luxembourg Finance Labelling Agency, available at: <https://luxflag.org/what-we-do/>.

C. Thompson, 'How 19th Century Scientists Predicted Global Warming' (2019) 17 *JSTOR Daily*.

United Nations Climate Change, *The Paris Agreement. What is the Paris Agreement?*, available at: <https://unfccc.int/process-and-meetings/the-paris-agreement>.

United Nations Environment Programme, *2022 Global Status Report for Buildings and Construction*, 9 November 2022.

United Nations Human Rights, *Guiding Principles on Business and Human Rights* (2011) available at: https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinessshr_en.pdf.

World Green Building Council, *About green building. The benefits of green buildings* (2018), available at: <https://www.worldgbc.org/benefits-green-buildings>.

World Green Building Council, *Sustainable Building Certifications*, available at: <https://worldgbc.org/sustainable-building-certifications/>.