

Viktória Deák

The MNB' Green Programme



Summary

This paper establishes that central banks, supervisors and the financial system play a key role in mitigating climate change and other environmental anomalies. However, the situation in Hungary highlights the challenges faced by the financial system that make it difficult to assess, manage and measure financial risks related to climate change. In order to maintain the stability of the financial system and promote sustainable finance in Hungary, the Hungarian central bank launched its Green Programme. The paper examines the measures taken so far in this initiative and their results. Finally, it notes that since the start of the programme, the domestic green financing environment has likely improved, but additional tools will be required, in particular to increase the preparedness of the financial sector for financial risks related to climate change.

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INTRODUCTION

Climate change and other environmental anomalies are among the most significant problems of the present era; this fact and the negative consequences are nowadays the subject of considerable media coverage. In addition to transitioning to production with low greenhouse gas (GHG) emissions, it is also vital to change our consumption patterns as soon as possible, because if we continue to follow the “business as usual”¹ scenario of “no action”, we will face irreversible and damaging consequences for the environment, society and the economy in the

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decades to come. The importance of the issue is reflected in the fact that central banks, financial supervisors and financial markets now also consider the issue a priority and are involved in tackling the problem. But the question arises: what tools can central banks and supervisors use to respond to these challenges? This paper describes the impact of climate change on the financial system and the related central bank roles. It also assesses the situation and the fundamental challenges of the financial system in Hungary, and shows how the Green Programme launched by the Hungarian central bank addresses the problems.

THE ROLE OF CREDIT BANKS IN THE FACE OF CLIMATE CHANGE

Climate change and other environmental problems can cause significant losses not only for ecosystems and society, but also for the economy and, through it, the financial system. The Network for Greening the Financial System (NGFS), an organisation bringing together central banks and supervisors, pointed out as early as 2018 that “climate-related risks are a source of financial risk. It is therefore within the mandates of central banks and supervisors to ensure that the financial system is resilient to these risks.” (NGFS, 2019:2). Looking at climate change and possible societal responses to it, the Bank of England concluded that financial risks from climate change are essentially a reflection of two risk factors: physical and transition. While physical risk refers to the likelihood of loss events caused by increasing climatic events and environmental anomalies such as floods, droughts, heat waves, sea-level rise or loss of biodiversity, transition risk can result from the transition towards a low-carbon economy, which may be manifested *inter alia* in market and technological change, as well as environmental policy measures. To reduce physical damage, it is necessary to shift the current carbon-intensive economy towards a more sustainable, low-emissions economic model. If the pace of transition is too fast for real economic actors, the functioning of these industry players will be jeopardised, which could threaten not only the stability of the financial sector but also price stability (Bank of England, 2018). It is therefore justified to apply micro- and macroprudential policies adapted to the effects of climate change, to fully identify systemic risks and to introduce risk mitigation measures in the functioning of the financial system. Christine Lagarde, President of the European Central Bank, also highlighted the risk of disregarding and delaying, because the later we take the necessary steps, the greater the losses we face (Lagarde, 2020).

On the other hand, the financing needs of tackling climate change and other environmental problems is of a scale that cannot be met by public finance alone, and therefore the involvement of private funds is essential. Although many central banks only have a secondary mandate to support economic policy, by mobilising the financial system, the increase in and improvement of financing for sustainable investment will contribute to a successful transition to a low-carbon economy, which will also reduce the financial sector's climate change risks in the long run. With the right incentives in place, a reallocation of financial flows can be achieved without endangering price stability, whereby the financial sector reallocates capital from high-emissions to low-emissions activities, thus supporting the transition of the real economy to a sustainable path (DG Trésor, 2017).

NATIONAL SITUATION – KEY CHALLENGES

Hungary is one of the most vulnerable countries to climate change in the European Union (ITM, 2018), which means that the Hungarian financial system's exposure to environmental risks is also significant. In March 2021, the Magyar Nemzeti Bank (MNB) published for the first time its Green Finance Report, which provides a snapshot of the environmental sustainability of the Hungarian financial sector. The document presents a detailed analysis showing that, among other things, there are a number of deficiencies and fundamental obstacles to the transition of the financial intermediation system to a sustainable path (MNB, 2021a).

The Report highlights the importance of mitigating these problems. With the proper assessment and management of environmental risks and long-term strategic planning, financial institutions are expected to reduce the financing of unsustainable economic activities and promote the implementation of environmentally sustainable investments. This will not only contribute to the transition to a low-carbon economy, it will also stabilise the financial system by reducing the exposure of the financial system to climate risks (MNB, 2021a).

The Green Finance Report is based on a survey conducted by the central bank in 2019 and 2020, which examined the attitudes and preparedness of the banking sector from different approaches in the context of mainstreaming environmental sustainability aspects. The surveys show that the prudent management of risks from climate change is deficient, as more than half of domestic institutions have a short- to medium-term planning horizon of typically 3-4 years for business planning. However, business planning for over 10 years or more would be appropriate to properly address climate risks. Another significant problem which increases the climate exposure of financial institutions is that the identification of climate-related financial risks is not yet addressed in more than half of the banking sector. Although most credit institutions consider it relevant to identify climate risks, they lack the resources, expertise or methodologies to be able to assess them. The main reason is that the traditional risk management methodology relies on historical data, which does not allow for the assessment of climate risks due to lack of data, and thus requires different methodologies, such as stress tests, scenario analyses and quantification of risk exposures. As climate risks are difficult to measure and can only be assessed over the long term, the above methods are also in the development phase (MNB, 2021a).

The MNB also attempted to quantify the preparedness and climate risk exposure of credit institutions. It assessed the preparedness of financial institutions in four areas, and accordingly identified the level of preparedness in terms of internal governance, risk management, business model and strategy, and disclosures. The scoring-based methodology was based on self-reporting by credit institutions, with results showing a wide variation in the areas covered, but overall low levels of preparedness were observed. In the categories of business model and strategy and disclosures, more than 75 per cent of banks were found to be significantly underprepared. This means that environmental sustainability considerations are not taken into account in the strategy development process, or that the related disclosures are extremely incomplete or there is no available information at all on the sustainability-related actions taken by financial institutions, or data on the emissions by financed activities (Fejes, 2021).

The analysis also looked at banks' exposure to climate risk, which is also estimated to have significant implications. The methodology looks at the corporate loan portfolio of intermediary institutions, based on the greenhouse gas intensity (GHG)² of the sectors of the national economy which are financed. The model assumes that highly GHG-intensive companies carry a high transition risk, i.e. they may incur significant losses in the transition to a sustainable economy depending on the evolution of climate policy and regulation. Based on the analysis, by balance sheet total, 57 per cent of the banking sector has more than 15 per cent exposure to the most polluting sectors within its corporate loan portfolio. This ratio is high enough to result in significant losses for credit institutions in the event of a sudden green transition (Fejes, 2021).

The climate risk exposure of the financial intermediary system can be reduced by increasing the financing of green investments and phasing out the financing of unsustainable economic activities. In addition, financing economic activities and investments that can be considered environmentally sustainable, such as renewable energy production, energy efficiency improvements and electromobility, represents a major business potential for the financial sector. The MNB (2021) concluded in a study that renewable energy is a stable, crisis-resilient and dynamically emerging sector, and contributes to achieving Hungary's climate policy objectives. The increase in the share of renewable energy by 2040, set by the Hungarian state, foresees a large expansion of photovoltaic solar power capacity. The expected capacity expansion of solar power plants can be coupled with a total new investment of around HUF 2,250 billion, the financing requirements of which could mean up to HUF 1,600 billion in new lending by the target decade. It can therefore be seen that the need for investment in the green economy transition is very high, especially in the energy sector, which also offers a business opportunity for the financial sector (MNB, 2021b).

Nevertheless, the penetration of financing for sustainability and the range of financial products is low in Hungary. Quantified through a few examples, according to the MNB database, the share of green bonds issued by non-financial enterprises was 11 per cent, the green share of government debt securities was 3.9 per cent, while the share of sustainable investments was approximately 0.5 per cent in 2020. Given the novelty of the products, data collection and reporting methodology for the listed financial instruments is not standardised and it is difficult to aggregate the positive impact of the products at the portfolio level (MNB, 2021a).

For loans, this ratio is difficult to estimate. The fundamental problem is, for example, the quantification of the green stock of corporate loans. The difficulty stems from the lack of a uniform green definition; therefore, it is only possible to estimate the proportion of loans disbursed for green purposes in Hungary. Due to these limitations, a more reliable estimate can only be given for loans related to energy production, where the solar power plant loan portfolio is 2.5 per cent of the total domestic corporate loan portfolio, according to MNB calculations (MNB, 2021a).

Green retail lending may also represent a significant business opportunity for the financial sector, as 97 per cent of Hungary's housing stock is considered to be energy inefficient, which is linked to significant carbon emissions (MNB, 2021a). The uptake of green housing loans,

and with this the energy upgrading of residential real estate, is further hampered by the level of information and income situation of Hungarian society. A study by the Hungarian Energy Efficiency Institute (2021) highlights that – although the rate of renovation is relatively high in Hungary – the depth of renovation is low, and thus does not bring the desired energy efficiency improvements. Households that renovate are not sufficiently informed about the long-term benefits of energy efficiency, and therefore they undertake easy and of course low-investment renovations resulting in a “lock-in”³ effect (MEHI, 2021). However, investments in renewable energy and appropriate energy efficiency in residential buildings could make a significant contribution to climate change mitigation, and their financing could also provide credit institutions with a more stable retail loan portfolio (MNB, 2021a).

Summarising the situation in Hungary, the level of preparedness of Hungarian financial institutions is low, their exposure to climate risk is substantial, and this is reinforced by the low level of sustainable finance and financial products, which is further exacerbated by the lack of decision-makers and financial professionals with expertise in sustainability issues and the low level of public awareness. If there is no change in the period ahead, the systemic risks listed above will intensify, which will have a significant impact on the stability of the domestic financial system.

THE GREEN PROGRAMME OF THE MAGYAR NEMZETI BANK

Responding to the global environmental challenge, the Magyar Nemzeti Bank launched its Green Programme in 2019, with the basic objective of improving the environmental sustainability of the domestic financial system. Under the programme, the central bank, in accordance with its statutory mandate, “supports the maintenance of the stability of the financial intermediary system, the enhancement of its resilience, its sustainable contribution to economic growth, furthermore the economic policy of the government using the instruments at its disposal” (MNB, 2019a:7).

The Programme is built around three pillars, the most important of which are the measures affecting the financial system. These measures are complemented by programme items on social and international relations and activities to green the MNB’s own operational activities, which also have a major impact on the development of sustainable finance (MNB, 2019a). Since its launch in 2019, the central bank has already taken a number of steps to make the financial system more sustainable. In addition, in August 2021, the Hungarian parliament issued the MNB a sustainability mandate through an amendment to the law, and thus climate and environmental aspects may play a more high profile role in its activities without jeopardising the achievement and maintenance of price stability (MNB, 2021c). In light of this, the rest of the paper explores possible solutions to the above challenges.

Pillar I: Initiatives in the financial sector

The central bank’s actions under the first pillar seek to achieve three main objectives, which are closely aligned with the central bank’s mandates. Accordingly, the Green Programme’s primary tasks are to develop a financial system resilient to environmental economic shocks,

to identify risks from climate change and other environmental anomalies, and to develop a green domestic financing environment.

To explore the systemic risks from climate change and environmental degradation, the MNB conducted a long-term climate stress test⁴ that illustrates the resilience of the banking sector to severe economic shocks and downturns up until 2050. The stress test is based on a dynamic modelling of three climate scenarios, in which the variable under study is the evolution of non-performing loans in the domestic banking system. Different climate scenarios highlight the importance of acting at the right pace. The model predicts that if the “Failed transition” climate scenario occurs, the proportion of non-performing loans will rise to over 20 per cent due to adverse environmental impacts on the economy, which will seriously undermine the profitability and capital position of credit institutions, thereby threatening the stability of the financial system. Credit institutions experienced a similar deterioration in portfolio quality during the 2008 global financial crisis. The “Disorderly Transition”, through delayed market measures, would create transition risks for carbon-intensive sectors, coupled with a sudden devaluation of their assets and confidence shocks. In a fast-changing market environment, the functioning of the financed real economic players is threatened, which has an almost immediate negative impact on the financial intermediary system. In this case, a significant spike in the non-performing loan ratio should be expected in the short term. It is important to note that even the “Orderly Transition” scenario, where the transition is achieved through continuous and scheduled decarbonisation measures, envisages a lower fluctuation of non-performing loans. However, it must also be recognised that the expected losses on this trajectory can be minimised. The stress test helps the financial intermediary system to understand the financial risks associated with climate change. It also highlights the need to integrate appropriate risk mitigation measures into risk management systems and to increase the financing of low-carbon sectors within the corporate loan portfolio.

It has already been clarified that improving the green finance environment helps to reduce the climate exposure of the domestic financial system and mitigates the risks of transition, and that green finance needs to be developed in Hungary. For these reasons, the Hungarian central bank has introduced a unique green preferential capital requirement programme to expand green financing. Since capital requirements affect the cost of capital of bank loans, the preferential treatment provided in this manner can help achieve green lending targets without reducing bank profitability. The preferential capital requirements scheme has been promoted on both the retail and corporate business sides, with a rate of 5 percent, and in some cases 7 per cent, of the exposure to which the preferential rate applies. The retail preferential rate covers energy efficient (at least BB energy rating) housing loans, introduced on the basis of the “green hypothesis”. According to the green hypothesis, financing an investment to improve energy efficiency has a lower credit risk than transactions that are identical in all other parameters. This can be justified by the fact that the reduced energy consumption associated with modernisation results in lower regular monthly costs⁵ for the household, and that modernisation increases the value of the property, which results in a better loan-to-value ratio (MNB, 2019b).

The corporate preferential capital requirement programme, launched in December 2020, aims at a shift in the balance sheet of credit institutions towards industries less exposed to transition risks. The preferential treatment was initially targeted at banks' green bond exposures and renewable energy loans. At the end of the first half of 2021, 90 per cent of the banks relevant to the programme were participating (by balance sheet total). Participating institutions benefited from HUF 42 billion in green bonds and HUF 121 billion in photovoltaic power plant loans. In September 2021, based on the success of the programme, the green corporate preferential capital requirement was extended to other areas such as electromobility, sustainable agriculture and food, and energy efficiency investments. As a new element, transactions that have been originated under the credit institutions' own or the borrower's green financing framework can also benefit from the preferential treatment (MNB, 2021d).

In addition to increasing the green loan portfolio, the sustainable development of the green bond and equity market is certainly also important, as the mobilisation of capital market resources is also needed to finance Hungary's environmental and climate goals. The MNB started developing the Sustainable Capital Markets Strategy in July 2020 to expand sustainable investment. The strategy aims to ensure that capital market instruments can finance investments that contribute to mitigating climate change and ecological problems at a higher rate than the scale described above, and to foster more favourable access to finance for environmentally sustainable companies. The initiative will enable the exploration of the supply and demand-side constraints to the development of sustainable financial instruments, the identification of market development measures to support development and the development of a supportive regulatory environment. The final results of the project are expected in the first quarter of 2022 (MNB, 2020a).

In order to improve the resilience of the financial system the MNB issued its recommendation No 5/2021 (IV. 15.) on climate change and environmental risks and the integration of environmental sustainability aspects in the activities of credit institutions (also known as the Green Recommendation⁶) in April 2021. The recommendation sets out fundamental expectations for credit institutions, which, in the spirit of comprehensiveness, cover several areas of credit institutions' operations: business model and strategy, corporate governance, risk management and disclosures. The recommendation to promote a quasi-institutional reform will increase the preparedness of financial institutions for the regulatory changes relevant to financial risks arising from climate change, as the current situation shows that a significant portion of the domestic banking sector does not take into account environmental sustainability aspects in its operations, while it is highly exposed to climate and environmental risks. The recommendation provides guidance on the full identification, appropriate measurement, management, control and transparent disclosure of these risks. By doing so, the central bank is helping credit institutions to mainstream environmental sustainability considerations in their business activities. As part of its supervisory activity, the MNB expects credit institutions to conduct a self-assessment survey in line with the Green Recommendation, based on which it will initiate prudential discussions according to a schedule developed by the banks, thereby helping to ensure the preparedness of credit institutions.

Last but not least, in line with the green mandate of the MNB, it has also looked at how green considerations can be mainstreamed into the monetary policy toolbox in addition to what has been discussed the above. As a result, the central bank has launched two additional programmes to further strengthen the financing environment for the renewal of the residential real estate stock, as detailed above. The Green Mortgage Bond Purchase Programme aims to create a domestic green mortgage bond market, which will contribute to the uptake of green mortgages. In addition, to further encourage green housing lending, the Green Home Programme was launched as part of the Funding for Growth Scheme, which provides green loans at preferential interest rates to households with the aim of building or purchasing near-zero energy homes (MNB, 2021e).

Pillar II: Social and international relations

Measures and policies under the first pillar can ensure the stability of the financial intermediary system and support the real economy in the transition to carbon neutrality, but to achieve this, adequate human capital is essential.

The second pillar of the Green Programme is intended, *inter alia*, to increase the pool of experts with sustainability expertise. It has been found that the assessment, management and evaluation of financial risks arising from climate change and the development of green financing services and financial products are also hampered by the shortage of financial experts with sustainability expertise. The central bank's key objective is therefore to promote a green mindset in the financial literacy of young people and the financial workforce. Equipping undergraduate economics students with green finance skills is key to ensuring sustainability in the financial sector. Under the Green Programme, a semester-long green finance course has so far been delivered at four prominent universities in Hungary. Since the autumn semester of the 2019 academic year, more than 600 students have taken part in one of the courses, a number that will continue to grow in the coming semesters. Specialised training for those already in the labour market is also important for the development of a sustainable banking sector in Hungary, and several courses on green financing and advisory services have been launched for them, organised by a subsidiary of the MNB (MNB, 2021f).

It is easy to see that central banks, supervisors and financial intermediaries, although they are experts in finance, do not have scientific qualifications. On the other hand, NGOs, communities and civil society organisations working on climate protection and the natural environment have special roles, knowledge and capacities that create synergies with the financial and regulatory powers of the MNB. The programme therefore also pays particular attention to the cooperation between domestic and foreign market and social actors relevant to green finance, which can help in fine-tuning domestic financial measures related to sustainability. The practical form of cooperation is organised on several platforms, including international working groups, workshops, conferences and social consultations. As an example, since 2019 the MNB has been a member of the Network for Greening the Financial Systems, participating in international work on green finance, thus promoting the sharing of experiences and the adoption of international good practices. The annual international Green Finance Conference also provides an opportunity to learn the views of experts (MNB, 2019a).

Pillar III: Further greening the MNB's own operations

Through its mandate as the guardian of the financial system and price stability, the Magyar Nemzeti Bank plays a key role in the Hungarian financial sector, and its activities are therefore of macroeconomic importance, but its impact on the microenvironment is also not negligible. With the latter in mind, in 2011 the central bank declared its responsibility towards the environment and its commitment to the continuous improvement of its environmental performance (MNB, 2020b).

The MNB's activities also have a substantial environmental impact, consisting of direct and indirect environmental impacts arising from its own operational activities and the direct environmental impacts of the assets on the central bank's balance sheet. Accurate information on the latter, indirect GHG emissions is not yet available. Therefore, as a next step, the central bank, following international recommendations, has started to prepare the so-called TCFD Report (Task Force on Climate-Related Financial Disclosures), which will provide a snapshot of the intensity of the carbon footprint of the financial portfolio managed by the Magyar Nemzeti Bank. The TCFD Report describes a way to integrate climate risk into the MNB's corporate governance, strategy creation and risk management, enabling a stronger and more resilient central bank presence for the Hungarian financial intermediary system, while encouraging the engagement of financial market participants through its own example (MNB, 2021g).

The MNB also pays particular attention to emissions arising in the course of its operational activities. The environmental commitments made in the Environmental Declaration will be implemented in line with the third pillar of the Green Programme. As a result, the central bank has committed to carbon-neutral operation from 2021, setting an example for domestic credit institutions. According to the ambitious environmental and climate pledge, a reduction in carbon dioxide emissions of 30 per cent by the end of 2022 and of 80 per cent by 2025 will be achieved, for example by installing photovoltaic panels on its properties, i.e. by covering electricity consumption from renewable sources. The rest of the carbon emissions will be neutralised in the form of compensation (MNB, 2020b). This commitment is also demonstrated by the fact that the central bank started to offset its environmental impact in 2020, thus neutralising the carbon footprint of the Green Finance Conference 2019, which took place earlier, with a habitat reconstruction programme near the village of Pápateszér. To compensate for emissions that cannot be further reduced, neutralisation projects will continue in cooperation with the NGO WWF Magyarország (MNB, 2021h).

SUMMARY

The study concludes that there is a need for the Hungarian central bank to develop a supervisory strategy tailored to the financial risks arising from climate change and other environmental anomalies. Systemic risks arising from climate change may affect the stable functioning of the financial system and thus put price stability at risk. To address these challenges, the transition of the domestic financial system to a sustainable path is justified, but financial institutions

still need to overcome a number of obstacles identified in the study. Based on a holistic approach, the Magyar Nemzeti Bank aims to provide solutions to the problems that have been identified, which could strengthen the preparedness of the financial system and reduce its climate exposure. The creation of a domestic green financing environment is also an important milestone in maintaining the long-term stability of the financial system and supporting the transition of the real economy to a sustainable path. It is important to note, however, that while the MNB's efforts are necessary to steer the financial system towards a sustainable path, they are not sufficient on their own, as the collaboration of domestic financial institutions is essential. As the study demonstrates, financial institutions can be mobilised with the right incentives. Successful transition will require a strong commitment in the coming years. Finally, there is a need for a well-prepared financial system that is resilient to environmental economic shocks and offers green financing in the coming decades, for which the Green Programme of the Magyar Nemzeti Bank provides the ideal framework.

NOTES

- ¹ “Business as usual”/“No change” scenario, i.e. we move forward without any change in regulations and policies.
- ² It shows how many grams of GHG emissions result from the production of 1 forint of value. The higher the ratio, the higher the GHG intensity of the given activity.
- ³ In Hungarian “belakatólás”. “In our case, when poorly planned renovations preserve an outdated situation for additional years with no energy savings or emission reductions” (Sáfián, 2021).
- ⁴ The results of the climate stress test conducted by the MNB are expected to be published by the end of 2021.
- ⁵ Monthly maintenance costs related to the residential real estate, such as: electricity consumption, water consumption.
- ⁶ Recommendation No 5/2021. (IV. 15.) of the Magyar Nemzeti Bank on climate-related and environmental risks and the integration of environmental sustainability considerations into the activities of credit institutions <https://www.mnb.hu/letoltes/5-2021-zold-ajanlas-2.pdf>

REFERENCES

- Bank of England (2018): *Transition in thinking: The impact of climate change on the UK banking sector*. London <https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/report/transition-in-thinking-the-impact-of-climate-change-on-the-uk-banking-sector.pdf> (Downloaded: 24 August 2021).
- DG Trésor (2017): *Evaluating Climate Change Risks in the Banking Sector*. Report required under Article 173 V° of the Energy Transition and Green Growth Act No. 2015–992 of 17 August 2015, Directorate General of the Treasury, Paris <https://www.afi.es/webAfi/descargas/1857306/1252800/Evaluating-Climate-Change-Risks-in-the-Banking-Sector.pdf> (Downloaded: 24 August 2021).
- Fejes, Tibor (2021): *Jelentős kockázat, alacsony felkészültség — magyar bankok a klímaváltozás árnyékában (Considerable risk, low preparedness – Hungarian banks in the shadow of climate change)*. <https://www.napi.hu/magyar-vallalatok/mnb-bank-klimavaltozas-hitel.736863.html> (Downloaded: 20 October 2021).
- ITM (2018): *A 2018–2030 közötti időszakra vonatkozó, 2050-ig tartó időszakra is kitékintést nyújtó második Nemzeti Éghajlatváltozási Stratégia (Second National Climate Change Strategy 2018-2030, with an outlook to 2050)*. Annex to the OGY Decision 23/2018 (X. 31.), Ministry for Innovation and Technology.
- Lagarde, Christine (2020): *Climate change and the financial sector*. European Central Bank https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200227_1~5eac0ce39a.en.html (Downloaded: 24 August 2021).

- MEHI (2021): *Hazai felújítási hullám – A magyarországi lakóépületállomány energiahatékonysági korszerűsítésben rejlő lehetőségek, egyes támogatási eszközök széles körű hatásainak vizsgálata (Domestic housing improvement wave – Examining the potential of energy efficiency upgrading of residential buildings in Hungary and the broad impact of certain support instruments)*. Magyar Energhatékonsági Intézet (Hungarian Energy Efficiency Institute - MEHI) https://mehi.hu/sites/default/files/mehi_hazai_felujitasi_hullam_tanulmany_2021.pdf (Downloaded: 3 September 2021).
- MNB (2019a): *The MNB's Green Programme* Magyar Nemzeti Bank <https://www.mnb.hu/letoltes/az-mnb-zold-programja-1.pdf> (Downloaded: 26 August 2021).
- MNB (2019b): *Lakossági zöld hitelezés Magyarországon (Green retail lending in Hungary)*. Magyar Nemzeti Bank <https://www.mnb.hu/letoltes/lakossagi-zold-hitelezes-magyarorszagon.pdf> (Downloaded: 26 August 2021).
- MNB (2020a): *Hamarosan elindul hazánk Fenntartható Tőkepiaci Stratégiájának tervezése (Planning of Hungary's Sustainable Capital Market Strategy to start soon)*. Magyar Nemzeti Bank. <https://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2020-evi-sajtokozlemenyek/hamarosan-elindul-hazank-fenntarthato-tokepiaci-strategiajanak-tervezese> (Downloaded: 3 September 2021).
- MNB (2020b): *A Magyar Nemzeti Bank Környezetvédelmi Nyilatkozata (Environmental Statement of the Magyar Nemzeti Bank)*. Magyar Nemzeti Bank, Budapest.
- MNB (2021a): *Green Finance Report*. Magyar Nemzeti Bank, Budapest.
- MNB (2021b): *A hazai megújulóenergia-termelés finanszírozása (Financing the Hungarian renewable energy production)*. Magyar Nemzeti Bank, Budapest.
- MNB (2021c): *Az Országgyűlés fenntarthatósági mandátummal ruházta fel az MNB-t (Parliament gives MNB sustainability mandate)*. Magyar Nemzeti Bank <https://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2021-evi-sajtokozlemenyek/az-oroszaggyules-fenntarthatosagi-mandatummal-ruhazta-fel-az-mnb-t> (Downloaded: 3 September 2021).
- MNB (2021d): *Rövidesen még többféle zöld vállalati, önkormányzati hitelt kínálhatnak a bankok (Banks will soon have a wider variety of green loans to offer to companies and local governments)*. Magyar Nemzeti Bank <https://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2021-evi-sajtokozlemenyek/rovidesen-meg-tobbfele-zold-vallalati-onkormanyzati-hitelt-kinalhatnak-a-bankok> (Downloaded: 2 September 2021).
- MNB (2021e): *Zöld monetáris politikai eszköztár-stratégiát hirdetett a Magyar Nemzeti Bank (The Magyar Nemzeti Bank announces the Green Monetary Policy Toolkit Strategy)*. Magyar Nemzeti Bank <https://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2021-evi-sajtokozlemenyek/zold-monetaris-politikai-eszkoztar-strategiat-hirdetett-a-magyar-nemzeti-bank> (Downloaded: 3 September 2021).
- MNB (2021f): *Courses*. Magyar Nemzeti Bank <https://www.mnb.hu/greenfinance/kepzesek> (Downloaded: 3 September 2021).
- MNB (2021g): *Fenntarthatósági és jegybanki politika – Zöld szempontok az MNB monetáris politikai eszköztárában (Sustainability and central bank policy – Green aspects of the Magyar Nemzeti Bank's monetary policy toolkit)*. Magyar Nemzeti Bank, Budapest.
- MNB (2021h): *Az MNB a WWF Magyarországgal együttműködve válik karbonsemlegessé (The MNB becomes carbon neutral with WWF Hungary)*. Magyar Nemzeti Bank <https://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2021-evi-sajtokozlemenyek/az-mnb-a-wwf-magyarorszaggal-egyuttmukodve-valik-karbonsemlegesse> (Downloaded: 3 September 2021).
- NGFS (2019): *A call for action Climate change as a source of financial risk, Executive summary*. Network for Greening the Financial System https://www.ngfs.net/sites/default/files/medias/documents/synthese_ngfs-2019_-_17042019_0.pdf (Downloaded: 24 August 2021).
- Sáfán, Fanni (2021): *Ezermilliárdokat dobtunk ki 5 év alatt az ablakon a rossz lakásfelújításokkal (Thousands of billions have been thrown out of the window in 5 years with bad housing improvements)*. MásfélfoK <https://masfelfok.hu/2021/02/08/ezermilliardokat-dobtuk-ki-5-ev-alatt-az-ablakon-a-rossz-lakasfelujitasokkal/> (Downloaded: 3 September 2021).