GREEN FINANCE REPORT

2025

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The primary objective set for Magyar Nemzeti Bank (MNB) by Act CXXXIX of 2013 on the National Bank of Hungary is to achieve and maintain price stability. Without jeopardising the primary objective, the MNB is also responsible for supporting the stability of the financial intermediary system, and increasing its resilience, ensuring its sustainable contribution to economic growth, and supporting the government's economic and environmental sustainability policies with its own tools.

The Parliament decided to extend the MNB's mandate on 28 May 2021 to support the government's environmental sustainability policy, making it the first central bank in the EU to receive a green mandate. Environmental sustainability covers the fields of mitigating climate change and adaptation, the sustainable use of water resources, transition to a circular economy, preventing and reducing the pollution of the environment, and protecting and restoring the biodiversity and the ecosystems. The main objective of the present "Green Finance Report" is to provide an annual overview of the Hungarian financial sector's environmental sustainability-related risk exposure, and the financing activities promoting sustainability, as well as the MNB's related sustainability programmes.

The report was prepared primarily based on the data available as of 31 December 2024. Data in different reporting periods get updated with varying regularity, so the time horizon of the analyses may vary in some cases. The document was printed using a solution with the lowest possible environmental impact. Please print the electronic version only when necessary.

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Preface

Dear Reader,

In financial systems around the world, the primary mandate and most important objective of central banks is to achieve and maintain price stability. In pursuing this goal, alongside the traditional instruments of monetary policy, environmental sustainability objectives are playing an increasingly prominent role in the 21st century. Climate change is manifesting in increasingly extreme weather events each year, causing damage in almost all areas of life. On one hand, these events result in financial losses in built infrastructure, agriculture and industry – posing growing challenges, for both national economies and the global financial system. On the other hand, escalating environmental risks act as inflationary pressures as well. Against this backdrop, it is clear why central banks worldwide are striving to become flagships of the green transition.

Hungary is a pioneer, as the MNB was one of the first central banks in the world to be granted a legal mandate in this area. In May 2021, the Hungarian Parliament included the promotion of environmental sustainability in MNB's statutory mandate –to support the transition of the Hungarian economy in its climate transition.

Building on this mandate, MNB has been continuously taking steps towards the development of a resilient economic and financial system that is capable of withstanding the negative impacts of climate change. Now in its fifth edition, the Green Finance Report aims to present the MNB's sustainability-related initiatives. In addition to describing the measures MNB's taken, the report provides an in-depth analysis of the financial risks arising from climate change and recent developments in sustainable finance.

I trust this publication will serve as a valuable and informative resource for our readers.

Mihály Varga
Governor of the Magyar Nemzeti Bank

Executive Summary

Last year we exceeded the global pre-industrial average temperature by 1.55 degrees Celsius, making it the warmest year on record. This statement may sound familiar to readers of the 2024 Green Finance Report- only the figure has changed from 1.48 degrees Celsius. At the time, researchers estimated it had been 125,000 years since the Earth experienced such high temperatures, yet – consistent with forecasts – this threshold was significantly surpassed just a year later. On the positive side, global investment in the energy transition surpassed USD 2,000 billion in 2024, with the majority of funds allocated to power grid development, renewable energy and electromobility. Beyond climate change, biodiversity loss also presents a major challenge for policymakers. Measuring ecosystem degradation is far more complex than quantifying greenhouse gas emissions, yet it poses similarly significant financial risks. While central banks are only at the start of the learning curve, the Magyar Nemzeti Bank partnered with the OECD and the European Commission on a joint project to assess the financial risks stemming from biodiversity loss.

In Hungary, the average temperature in 2024 exceeded the 1991-2020 climate baseline by 2.01 degrees Celsius. Compared to the previous national record temperature set in 2023, this represents an increase of nearly 0.7 degrees Celsius. Several monthly temperature records were broken throughout 2024, and the exceptionally hot summer was marked by prolonged heatwaves and severe drought conditions. High temperatures persisted into September, with daily averages often exceeding historical norms by 10 degrees Celsius. In addition to heatwaves, there was a near-record flooding on the Danube as well, triggered by Cyclone Boris, which was fuelled by significantly warmer seas. In the energy sector – a key source of emissions – there was encouraging progress. The share of electricity generated from solar power rose from 18.4 percent to 25 percent in 2024, the highest rate in the European Union. In peak periods, solar energy covered more than 80 percent of Hungary's electricity demand and over 70 days in 2024, compared to just 10 days in 2023.

Climate risks for credit institutions did not increase in 2024 compared to the previous year, but several central bank initiatives supported the assessment of their impacts. Climate risk indicators, such as the Short-Term Climate Stress Test, the Bank Carbon Risk Index and the Climate Risk Matrix, peaked at similarly high levels as in 2023, but did not pose threats to financial stability. From 2025 onwards, the MNB requires banks to conduct their own climate stress tests. In 2024, the MNB also assessed the preparedness of banks and insurers in light of the expectations set out in the Green Recommendations, which will come into effect in 2025. Banks scored highest in the area of corporate governance while risk management received the lowest ratings. As for insurers, the smallest gap was identified in risk management, with the biggest shortcomings identified in disclosure.

The Green Preferential Capital Requirement Programme was extended by one year. As a result, exposures created until 31 December 2026 are eligible under the programme. When deciding on the extension of the programme, the MNB took into account the potential risks and effects of the incentive. Overall, the participating institutions were found to have a stable capital position, enabling them to meet the regulatory capital requirements even without the programme's capital discount. A key milestone supporting the programme's continuation was the publication of an empirical study in early 2025, which demonstrated that green corporate loans exhibit significantly lower default risk compared to conventional loans.

The value of green exposures under the programme exceeded HUF 1,345 billion by the end of 2024, marking a 54% increase year-on-year. The share of green loans within corporate lending reached 5.4 per cent, while in case of housing loans provided to households, this figure rose to 5.5 per cent. Regarding borrower-based measures that are meant to mitigate the systemic risks of household sector lending, more favourable rules are introduced for energy-efficient residential properties from 2025. Together with the new framework established for the green terms of Certified Consumer-friendly Housing Loans, came into force on 1 April 2025, these initiatives may further strengthen the market of green household sector mortgage loans.

In capital markets, sustainable exposures and their share showed moderate growth in 2024. The Government Debt Management Agency issued nearly HUF 700 billion in green sovereign bonds. The share of green bonds within the total stock of domestic government securities rose from 3.6 per cent in 2023 to 4.9 per cent in 2024, ranking Hungary among the top four in the European Union. Although the nominal value of total green corporate bonds has increased, their share has decreased from 24 per cent (in 2023) to 21 per cent. A slight increase was seen for green mortgage bonds, thanks to three successful issuances totalling nearly HUF 35 billion.

At the European level, supervisory authorities adopted comprehensive regulatory packages aimed at mitigating greenwashing risks. Under the Sustainable Finance Disclosure Regulation (SFDR), stricter requirements have been introduced for marketing communications, with the aim of promoting consistency in definitions, classifications, naming conventions, and transparency. From 2028 onwards, sustainability-related information for relevant market participants is expected to become accessible via dedicated EU-wide thematic websites. In Hungary, green investment funds, voluntary pension portfolios, and unit-linked insurance-linked funds still represent a relatively small share of the market—though the latter experienced notable growth in 2024. To foster the broader uptake of green financial products the MNB has made major updates to its SFDR "Q&A" document this year.

European sustainability regulation continues to reflect a dual approach, while disclosure obligations are expected to ease significantly, expectations around risk management are tightening. The Omnibus legislative package published in February 2025 aims to reduce the administrative burdens and enhance the competitiveness of businesses. It proposes comprehensive simplification, narrowing of the scope of entities affected, and reduced regulatory overlaps in sustainability data reporting, corporate due diligence, and taxonomy application Parallel with this, from 1 January 2025, the ESG (Environment, Social and Governance) risk related regulatory requirements applied in the Capital Requirements Regulation (CRR) are extended to include provisions on ESG risks, requiring institutions to incorporate ESG risk scenarios in stress testing and to disclose their ESG risk exposures.. As a result, ESG-related supervisory data reporting requirements are significantly expanding this year under EU regulation. By 2026, national authorities are also expected to implement the revised Capital Requirements Directive (CRD), which mandates institutions to systematically identify, measure, and manage ESG risks. Supervisory authorities, in turn, will be required to integrate ESG risks into their supervisory review and evaluation processes and into stress-testing activities. Where supervisory authorities identify severe climate-related risks, they will have the power to introduce a systemic risk buffer. In support of this regulatory evolution, the MNB issued a recommendation on the application of a standardised ESG questionnaire to improve the assessment and comparability of ESG information.

The international central banking community continues to place strong emphasis on expanding the knowledge base and best practices related to sustainability, climate change, and the green transition. According to the WWF 2024 report which assesses financial authorities from a sustainability perspective, several MNB initiatives contributed meaningfully to this agenda. In addition to participating in central bank knowledge exchanges, the MNB actively collaborates with several Hungarian institutions of higher education to promote green finance literacy among students and future professionals.

NGFS Dashboard

Category	Indicator	Unit	HU last year's value	HU this year's value	EU average	Reference period	Change
Real economy	Share of area under organic farming within the agricultural area	%	5,81	6,31	9,10	2022	▲
	Share of the protected land areas	%	22,40	22,4	26,00	2022	▬
	Share of renewable energy sources in total final energy consumption	%	15,13	17,12	24,55	2023	▲
	Energy intensity of the economy	Oil equivalent (kg)/€1000	180,64	171,94	95,85	2022	▲
	Net energy import	%	56,89	64,21	62,51	2022	▼
	Percentage of newly registered plug-in electric vehicles	%	10,50	11,7	20,70	2024	▲
	Change in greenhouse gas emissions since 1990	%	56,12	60,5	56,79	2022	▲
	CO_2 emissions per unit of production	Thousand tons CO2/$million	0,22	0,194	0,18	2022	▲
	EU ETS CO_2 market price	EUR/tCO2e	82,87	73	73,00	2024	▼
	Environmental tax revenues	GDP %	1,84	2,16	2,03	2023	▲
	Environmental protection expenditure rate	GDP %	1,50	1,4	2,20	2021	▼
	Adjusted net savings (ANS)	GNI %	11,50	11,5	11,60	2021*	▬
	Adjusted national net income (ANNI) growth rate since 2009 - average	%	2,45	2,49	1,22	2021*	▲
Risk	Natural resources rents	GDP %	0,20	0,4	0,20	2021*	▼
	Ecological deficit (biocapacity – ecological footprint)	Million global hectares/capita	1,28	1,22	n/a	2022	▲
	Bank Carbon Risk Index (Linear)	%	6,29	6,25	n/a	2024	▲
	Bank Carbon Risk Index (Gompertz)	%	14,88	14,89	n/a	2024	▼
Mobilisation	Ratio of green bonds – central government - stock	%	3,60	4,9	n/a	2024	▲
	Ratio of green bonds – central government - 2023	%	0,36	4,58	n/a	2024	▲
	Ratio of green bonds – companies - stock	%	24,13	21,54	n/a	2024	▼
	Ratio of green bonds – companies - 2023	%	8,48	16,59	n/a	2024	▲
	Ratio of green corporate loans	%	3,93	5,40	n/a	2024	▲
	Green/ESG based investment funds – stock	%	2,05	6,23	n/a	2024	▲
	Insurance sector – ratio of green unit-linked funds	%	5,39	7,58	n/a	2024	▲
	Green/ESG based voluntary pension funds	%	0,44	0,48	n/a	2024	▲
Global Initiatives	Ratio of banks joining global initiatives on sustainability - by number of institutions.	%	65,00	67	n/a	2024	▲
	Ratio of banks joining global initiatives on sustainability - by balance sheet of institutions.	%	90,26	88,38	n/a	2024	▼

1 Latest International Developments and Sustainability in Hungary

Global sustainability remained a pressing concern in the past year, particularly in the context of climate change and energy transition. Average global temperatures reached unprecedented highs, leading to severe heatwaves, prolonged droughts and intensified storm activity in various regions. Scientific consensus continues to underscore that global temperatures are persistently nearing the critical threshold of 1.5°C above pre-industrial levels (ratified by the Paris Climate Agreement). In the energy sector, the deployment of renewable energy sources continued to expand; however, fossil fuels still constitute a significant component of the global energy mix. Although investments in solar and wind power increased, challenges related to energy security and disruptions in global supply chains have constrained the pace of a comprehensive transition. In response, many countries have accelerated the development of national electricity grids and scaled up investments in energy storage technologies to enable more efficient utilization of renewable energy.

The tangible impacts of climate change became increasingly evident in Hungary as well. The frequency of droughts increased, and short but intense rainfall events became more common. These climatic changes pose considerable challenges for agriculture and infrastructure, necessitating urgent and coordinated actions in water management and biodiversity conservation. In terms of energy production, Hungary continues to pursue an increase in the share of renewable energy sources within its energy portfolio. In addition to solar and wind energy, growing emphasis is being placed on integrating biomass and other locally available, sustainable energy solutions. These efforts are essential not only for environmental sustainability but will also for enhancing energy independence and diversifying the country's energy supply. A key element of sustainability involves improving energy efficiency, particularly in the transport and construction sectors. By adopting energy-efficient technologies, promoting smart grid development, and encouraging green architectural practices, the MNB seeks to reduce both energy consumption and greenhouse has emission. Public awareness and the promotion of environmentally responsible lifestyles are gaining importance. The MNB remains committed to advancing green finance initiatives within the Hungarian financial system, thereby supporting the transition towards a sustainable and competitive future.

1.1 GLOBAL OUTLOOK

"Global heating is the bitter truth" – According to the data compiled by the UN's World Meteorological Organization (WMO)[1], the 1.5 degrees Celsius warming threshold established by the Paris Agreement – a milestone in which scientists emphasize the critical role that oceans have played in driving this process. Among the indicators used to measure last year's temperature rise (carbon emission, surface temperature increase, sea level rise, glacier retreat, and changes in sea ice extent) the most radical shift was observed in the heat retention capacity of the upper 2,000 meters of the oceans. It is worth noting that the 1.5-degree warming benchmark remains the subject of scientific debate[2], largely due to the different measurement and calculation methodologies applied to set the mean figures. Using monthly, annual, 10-year or 20-year temperature averages, discrepancies of a tenth- or even hundredth of a degree may occur. Nonetheless, one fact is beyond dispute: over the past decade global temperature records have been broken and the upward trend continues to accelerate.

Climate policy targets are setting the threshold for global average temperature rise at 1.5 or maximum 2 degrees Celsius, to ensure a safe and liveable planet. However, if climate policy is tied to fixed temperature thresholds, we are in an uncharted territory, due to the methodological challenges of calculating global average temperatures. Measuring atmospheric carbon dioxide concentrations is far more exact. What remains critical is that global emissions must first peak, then stabilise, and ultimately fall to net zero by the middle of this century. Achieving this would buy us time in the short term to meet our longer-term climate objectives. Net zero means that a country, city, company or building emits as much greenhouse gas as it

[1] WMO (2025): WMO confirms 2024 as warmest year on record at about 1.55°C above pre-industrial level

[2] Alejandra Borunda, NPR (2024): Countries agreed to try to hold global warming to 1.5 degrees Celsius. Is that still possible? Can global warming stay below 1.5 C?

removes from the atmosphere. In other words, it is not a strict requirement to achieve actual zero emissions, as long as the remaining emissions are offset, for example, through investments in renewable energy, environmental restoration, energy efficiency improvements, or the purchase of carbon credits. Over the long term, however, emissions must move toward absolute zero. In fact, the scientific consensus increasingly emphasises the need to go beyond zero – towards negative emissions – if we are to avoid the most catastrophic consequences of climate change.

Technologies to capture and store carbon dioxide already in the atmosphere (CCS) are expected to play a major role in the second half of the 21st century, according to experts. Significant innovation and R&D are needed to ensure that these technologies can be used on a mass scale, not just on an experimental basis. According to a report by the Global CCS Institute based on July 2024 data, the uptake of CCS projects is growing exponentially: there are 50 projects already operating worldwide, 44 are under construction, nearly 500 are in a planning stage, and a further 50 agreements (bilateral agreements between countries) contain an element on carbon sinks[3]. Nonetheless, if we go beyond the ecological limits of the socio-economic systems (i.e. the tolerance limits of our planet), even with carbon-absorbing technologies, we may face unpredictable climate changes, beyond the point of no return.

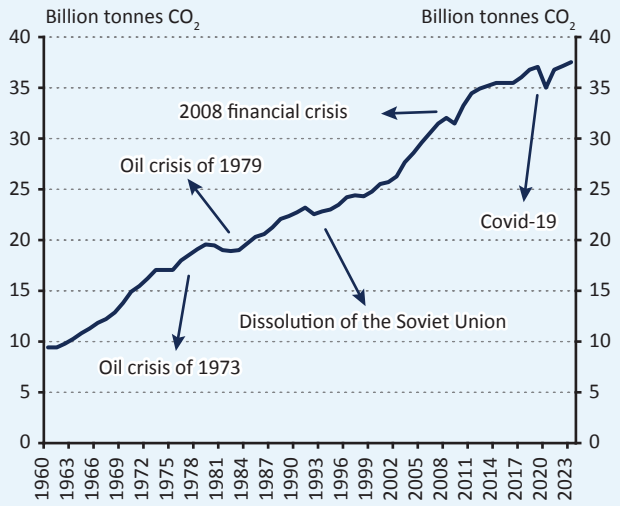
More than 80 countries held national or regional elections in 2024. Together, these countries account for half of the world's energy demand, making the outcome of these elections pivotal for the local, national and global energy policy shifts. Several states are delaying, reversing or failing to implement their greenhouse gas (GHG) emission reduction commitments, which has impacts on the financial system. An example for this is the United States' withdrawal from the Paris Agreement, which had ripple effects such as the Federal Reserve (Fed) exiting the Network for Greening the Financial System (NGFS), and numerous American banks leaving climate coalitions[4]. The recent EU parliamentary elections influenced the continuation of the European Green Deal, affecting the energy transition and regulatory stability. India, both the world's third-largest carbon emitter and a major player in the renewable energy market, also held elections, which were crucial for achieving the global climate targets to phase out coal and other fossil fuels and achieve 500 GW of renewable energy capacity by 2030.

One of the declared objectives of the COP29 Climate Summit held in Azerbaijan last year was to set measurable commitments. One of the key agenda items was scaling up climate finance and allocating the available resources more equitably to developing countries, which are more vulnerable to the impacts of climate change. After protracted negotiations, parties agreed to mobilise USD 300 billion per year from 2025 to 2035, which falls significantly short of the USD 1,300 billion annual need identified by developing countries. The next important milestone is due in early 2025, when parties to the United Nations Framework Convention on Climate Change (UNFCCC). must submit their updated Nationally Determined Contributions (NDCs) Globally we need to commit to a collective emissions reduction of at least 42 per cent by 2030, and 57 per cent by 2035, otherwise the 1.5 degrees Celsius target may become out of reach, potentially resulting in 2.6-3.1 degrees Celsius warming [5].

Global GHG emissions continue to rise, albeit at a slowing pace. Global CO_2 emissions from fossil fuel combustion (about three-quarters of total GHG) increased by approximately 0.8 per cent in 2024[6], which is a positive development compared to the 1.1 per cent increase in previous years, although the concentration of carbon dioxide in the atmosphere is still increasing (Chart 1.1). China and India remain the largest contributors to emissions from coal, oil and natural gas, but on a regional basis, the available data show a decline in both the EU and the US. In a sectoral breakdown, unsurprisingly, the energy industry, international aviation and maritime transport remain the primary drivers. Although deforestation and changes in land use continue to contribute significantly to the increase in global emissions, fortunately, recent trends show a decline. The greatest potential for improvement lies in Brazil, Indonesia and the Democratic Republic of Congo, which together account for over half of the global land-use-related CO_2 emissions.

[3] Global CCS Institute (2024): Global Status of CCS 2024. Collaborating for a net-zero future.
[4] Simon Jessop, Reuters (2025): JPMorgan becomes latest U.S. lender to quit Net-Zero Banking Alliance
[5] United Nations Environment Programme (2024): Emissions Gap Report 2024: No more hot air … please! With a massive gap between rhetoric and reality, countries draft new climate commitments. Nairobi
[6] Friedlingstein, P. et al. (2025): Global Carbon Budget 2024, Earth Syst. Sci. Data, 17, 965–1039, https://doi.org/10.5194/essd-17-965-2025, 2025.

Chart 1.1
Global CO_2 equivalent emissions from fossil energy sources

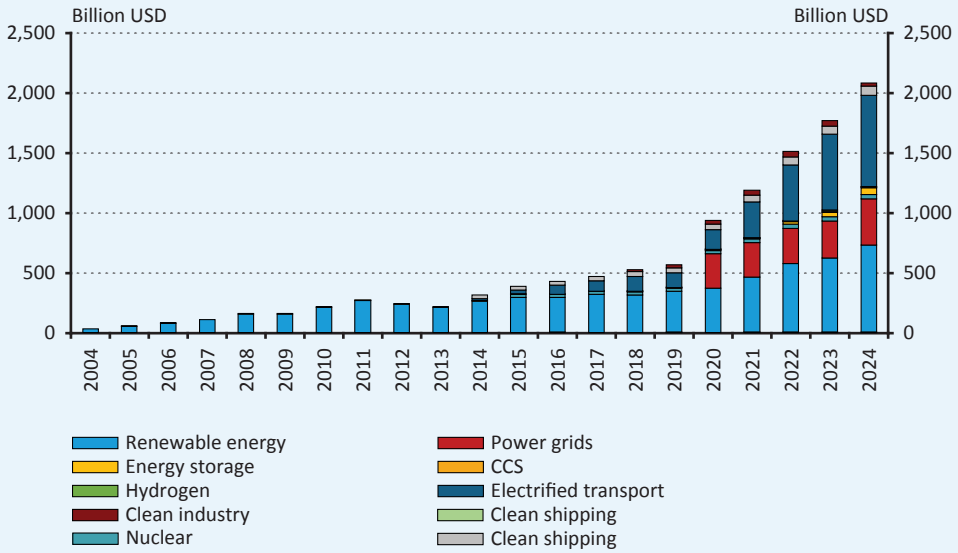


Source: Global Carbon Project and Global Carbon Budget

At the same time, the volume of investments supporting the energy transition reached a record-high USD 2,000 billion in 2024. This is critical toward peaking global emissions. While these public and private investments have doubled since 2020 (Chart 1.2), their growth rate slowed in the past year, declining from around 25% in earlier years to 11% in 2024. According to a Bloomberg analysis[7] tracking trends in ten sectors, the top three by investment volume were electromobility, renewables, and grid infrastructure—together absorbing 90% of total capital flows.

Renewable energy sources accounted for 30% of global electricity generation in 2023, driven largely by the expansion of solar and wind power[8]. While this upward trend is encouraging, the green transition could be further facilitated if electricity from renewable sources could replace fossil fuel-based power generation at a faster pace. However, unless the share of electricity in the global energy mix increases substantially, and technologies are improved to address intermittent generation, the role of renewables will remain limited. Total electricity demand is decreasing in the OECD countries (including the US and the EU), but rising in China, driven by the growth of electric vehicles, heat pumps, electrolysis for hydrogen production, air conditioning and data centres.

Chart 1.2
Total investments into the global energy transition, by year and sector



Source: Bloomberg New Energy Finance[9]

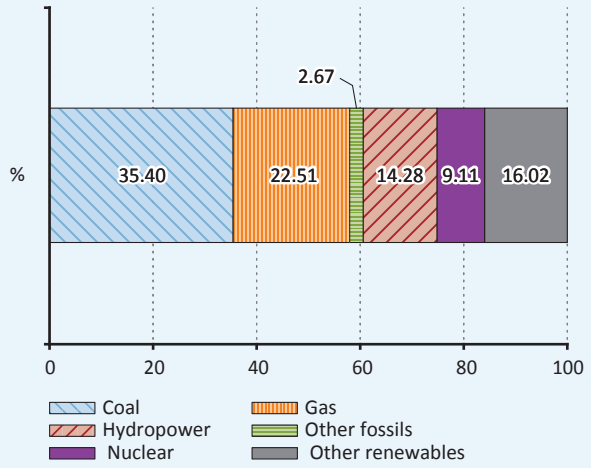
[7] Bloomberg (2025): Energy Transition Investment Trends 2025
[8] Ember (2024): Global Electricity Review. Global Electricity Review 2024 | Ember
[9] Bloomberg (2025): Energy Transition Investment Trends 2025

China's role remains dominant. As the world's largest carbon emitter, itis also the largest supplier of renewable energy. Of the over 560 GW increase in global renewable electricity capacity over the past 1–2 years, more than 350 GW came from China. The country leads the world in electric vehicle production: globally, one in five vehicles sold is electric[10], while in China it is six out of ten. China manufactures 80 per cent of all battery cells and solar modules and 65 per cent of wind turbines. In 2023, China accounted for 51% of global solar power and 60% of wind power production. Further, the electricity supplied from wind and solar power is now market priced, after the formerly applied fixed prices, which can be regulated by the local authorities for more flexible pricing. Existing feed-in tariffs will apply to installations commissioned before 1 June 2025, while clean energy plants installed after that date will be subject to the new rules[11].

Droughts and heatwaves have reduced hydropower output, hindering the energy sector's shift from fossil fuels to clean renewables. The share of renewable energy in the global electricity generation could be higher if the successive extreme droughts of recent years had not driven hydropower production to such low levels that the shortfall, especially in drought-stricken areas in China, India, Vietnam, and Mexico, had to be made up by coal[12]. Although hydropower still accounts for the largest share of clean energy (14.3 per cent) in the global electricity mix (Chart 1.3), growing physical climate risks, particularly more frequent droughts, pose serious challenges to its predictability and raise sustainability concerns for new hydropower plants, such as the 7 GW commissioned in 2023.

Humanity stands at a critical juncture in terms of the health of ecosystems. The populations of wild vertebrate species have declined by 73 per cent in the last 50 years[13]. Addressing the consequences of climate change, water cycle disruption, and nature loss will require not only local solutions[14], but also global cooperation. The loss of biodiversity presents a financial risk, as ecosystems provide essential services to the economy through, for example, pollination, water filtration, and soil regeneration. If these functions are impaired, the costs rise across sectors including agriculture, food production, energy production, health care. Measuring these impacts is more complex than assessing climate risks due to the spatial and temporal variability of ecosystem changes, creating significant methodological challenges. These risks can propagate throughout supply chains, increase production and insurance costs, and pose systemic threats to the financial system—placing increased responsibility on supervisors and central banks. While the methodologies linking nature-related and financial risks remain nascent, international examples are emerging, including surveys and supervisory frameworks among central banks. While the methodologies linking nature-related and financial risks remain nascent, international examples are emerging, including surveys and supervisory frameworks among central banks[15].

Chart 1.3
Total electricity generation by source (%)



Source: EMBER: Global Electricity Review 2024[16]

The transition to renewable energy, as a pathway away from fossil fuel dependence, is driving up demand for critical raw materials (CRMs). These materials are essential in achieving the objectives of the European Green Deal and reaching carbon neutrality. Lithium, cobalt or manganese are indispensable for batteries, electronic devices and the

[10] IEA (2024): Trends in electric cars – Global EV Outlook 2024 – Analysis – IEA
[11] Bloomberg (2025): China takes big step in letting market decide clean power prices.
[12] Ember (2024): Global Electricity Review 2024
[13] WWF (2024): Living Planet Report
[14] Global Commission on the Economics of Water (2024): The Economics Of Water: Valuing The Hydrological Cycle As A Global Common Good
[15] Financial Stability Board (2024): Stocktake on Nature-related Risks: Supervisory and regulatory approaches and perspectives on financial risk and NGFS (Network for Greening the Financial System) (2024): Nature-related Financial Risks: a Conceptual Framework to guide Action by Central Banks and Supervisors
[16] ibid (2024)

electric car industry. However, green technologies needed for the net-zero transition are significantly more CRM-intensive than conventional energy systems. Moreover, mining operations. for these materials are highly water-intensive and often located in arid regions[17], raising both economic and environmental sustainability concerns. To ensure supply stability and reduce reliance on imports, the EU has introduced the Critical Raw Materials Act[18], which aims to build strategic reserves and promote domestic processing. The EU also seeks to encourage cleaner production and more diversified supply chains for carbon-intensive goods imported from the developing countries (e.g. steel, aluminium or cement), through the Carbon Border Adjustment Mechanism (CBAM)[19].

Therefore, the 1.55 degrees Celsius warming measured by the WMO does not mean that international climate targets are definitively unattainable. According to the UN Environment Programme's 2024 report on the emission gap, the 1.5 degrees target is still achievable[20]. This would require further increasing the share of renewable energy in the global energy mix, reducing carbon emissions, maintaining and meeting the ambitious commitments at country level, and resetting the international climate-financing architecture, with the involvement of financial actors and the corporate sector. Unfortunately, the social perception on global trends is deteriorating: geopolitical conflicts are escalating, climate change and extreme weather anomalies are on the rise, and the acceleration of political polarisation, fake news and the spread of misinformation can lead to miscalculated and misleading leadership decisions.

Box 1
The Participation of MNB at the UN Biodiversity Conference (COP16)**

The objective of the COP16 Conference held in October 2024 in Colombia, in the city of Cali, was to support global efforts to protect biodiversity. A central theme of the conference was the implementation of the Kunming-Montreal Global Biodiversity Framework, alongside the development of National Biodiversity Strategies and Action Plans (NBSAPs), which, as of now, have been published by 46 of the 196 parties. Several forward-looking initiatives were showcased, including the world's first biodiversity bond, the establishment of a dedicated body recognizing the role of Indigenous People, and a special fund to ensure the fair distribution of the benefits of digital sequencing information (e.g. data and monetary gains derived from the use of genetic resources).

The summit did not reach a final agreement on biodiversity finance. While no consensus was reached in Cali on the financial plans to support biodiversity targets**,** negotiations concluded successfully in February 2025 in Rome**.** The urgency of the financing issue stems from the fact that public subsidies aligned with biodiversity goals remain significantly below the necessary levels. Meeting these targets will require the active engagement of the private sector, the entire financial system and central banks.

The MNB, in cooperation with the OECD has completed a joint project in 2024, through the European Commission's Technical Support Instrument (TSI). The project focused on assessing the financial risks stemming from biodiversity loss and developing supervisory methodologies to address them. This initiative is presented in detail in Chapter 2.4.

[17] PwC (2024): Climate risks to nine key commodities
[18] Critical Raw Materials Act – European Commission
[19] Carbon Border Adjustment Mechanism – European Commission
[20] United Nations Environment Programme (2024): Emissions Gap Report 2024: No more hot air … please! With a massive gap between rhetoric and reality, countries draft new climate commitments. Nairobi

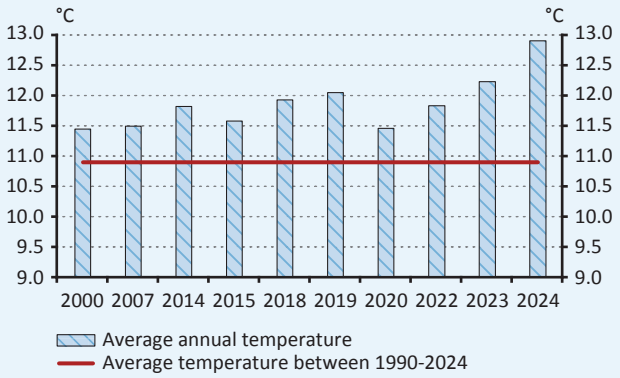
The results of the MNB-OECD-European Commission programme were presented on multiple occasions at COP16 **in Colombia.** Among others, during an official side-event co-hosted with OECD, the Hungarian Ministry of Agriculture and other international organisations. In addition, the MNB's annual Green Finance Conference was also dedicated to the topic of nature-related risks and biodiversity. At the conference, the representatives of several Hungarian banks, investment funds, companies, researchers and civil society jointly explored the international and domestic challenges and best practices. These dialogues play a key role in enhancing the financial sector's better understanding and management of biodiversity-related risks, thereby supporting sustainable economic development.

1.2 SUSTAINABILITY OF THE HUNGARIAN ECONOMY

The climate change and its negative impacts were also felt in Hungary last year. As has unfortunately become normal in recent years, average temperatures in Hungary have broken new records, and in the local and global research and analysis we find statements that it will be normal to see hotter and hotter temperatures than we have experienced this year, for the rest of our lives. Based on the detailed data available since 1901, 2024 was the hottest year not only globally but also in Hungary[21], as the warm temperature records were broken in several months, with the average mean temperature last year (12.91 degrees Celsius nationwide) exceeding the average temperature for the period of 1991 to 2020 by 2.01 degrees Celsius. As a closer and more palpable benchmark, the average annual mean temperature in Hungary was nearly 0.7 degrees Celsius higher than in the record year of 2023. Also a good illustration for the start of the new extreme era regarding temperature is that the 10 hottest years in Hungary compared to 1901 were in the 2000s, and since 2018 (except for 2021, which falls in the COVID-19 pandemic period) every single year has been on the top 10 highest temperature list (Chart 1.4).

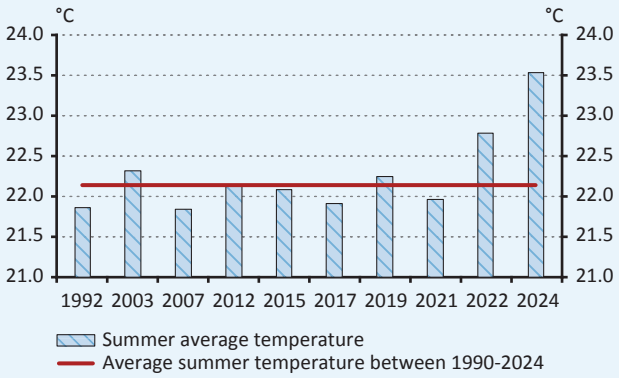
Within the whole year of 2024, it is worth highlighting that the summer was also hot[22]. The national daily heat record was broken on several occasions. In July and August, the highest recorded temperatures exceeded 40 degrees Celsius on several days, and there were also persistent heat waves during the summer. In terms of numbers, the national summer mean temperature for 2024 exceeded the 1991-2024 figures by 1.4 degrees Celsius, and as the whole year, the summer last year was also the hottest summer season since 1901 (Chart 1.5). The heat continued in September, with temperatures in the hottest parts of the country reaching 36-37 degrees Celsius, at least 10 degrees higher than usual in early September.

Chart 1.4
The 10 warmest years in Hungary since 1901



Source: MNB edited data, based on HungaroMet data

Chart 1.5
The 10 hottest summers in Hungary since 1901



Source: MNB edited data, based on HungaroMet data

[21] HungaroMet (2025): The warmest year since 1901 – preliminary analysis
[22] HungaroMet (2024): The warmest year since 1901 – preliminary analysis

Rising temperatures are causing major changes in many areas of life and can pose serious risks. The transformation of the environment is also having a significant impact on people, in ways that may not be obvious at first glance. High temperatures affect not only the human body, but also the quantity and quality of sleep. A Hungarian study[23] has made several interesting findings during the examination of the relationship between temperature and sleeping between 1976 and 2010, although the temperature in this period was well below that of the more recent past. On days when the average temperature is above 25 degrees Celsius, we sleep about 13 minutes less on average. There are estimates that if climate change does not slow down, by 2050, people are expected to sleep on average 6.5 hours less a year, with most of this sleep loss occurring in the summer months.

Rising temperatures may also have an unexpected impact on demography and birth rates. A Hungarian study[24] also looked at the impact of high average temperatures on human fertility in Europe, examining birth rates between 1979 and 2021. The research shows that high temperatures lead to significantly lower birth rates: if the average temperature on a day is above 25 degrees Celsius (a so-called summer day), 9 months later the number of births drops by 7 thousandths. This means that around 70 fewer babies are born in Europe on each of these days, although the effect is mitigated by a slight upturn in birth rates afterwards. In 2024, the number of summer days in Hungary was 118 (average 1991–2020: 86), the number of warm days above 30°C was 60 (average 1991–2020: 28), and the number of hot days (with the daily maximum above 35°C) was 14 (average 1991–2020: 3).

Climate change, with increasing warming, also poses risks to the maintenance and preservation of health. Scientific research[25] shows that certain medications work differently in hot weather, and their effects can be stronger or weaker. For example, the risk of heart attack is increased in hot weather by antihypertensive beta-blockers or anticoagulants that prevent thrombosis, while asthma or incontinence medicines can cause the body to overheat and blood pressure to drop in hot weather, and painkillers or insulin, which are absorbed more quickly in hot weather, can also cause problems. It has also been found[26] that patients who need regular medication feel worse in the summer, and better in cooler weather, as high temperatures reduce or eliminate the effects of many medicines and can damage life-saving and immediate-use medicines such as injections (Epipen) for allergic attacks.

High temperature records also have serious consequences for agriculture of course. On 1 June 2024, the total agricultural area in Hungary was 5.1 million hectares, or 55 per cent of the country's total area. A significant part of this, 81 per cent, was used as arable land, 16 per cent as grassland and 2.8 per cent as vineyards and orchards[27]. After a rainy year in 2023, last year was again a drought year, with only a small part of the country receiving near-normal level rainfall. Last year, farmers suffered significant losses, with 390,000 hectares of land declared drought-damaged[28] nationwide, for which the compensation fund paid out HUF 25.6 billion, far more than the HUF 2.8 billion in 2023[29]. 80 per cent of the reported drought damage affected two particularly water-demanding crops, maize and sunflower, followed by alfalfa and soybean (these 4 water-demanding crops covered 46 per cent of the arable land last year). Last year, farmers took out drought insurance for 700,000 hectares.

In mid-September 2024, Hungary was also hit by a near-record flood. This also highlights the extreme changes in the local environment and weather, with floods arriving soon after a summer of extreme heat and drought. Cyclone Boris, which mainly impacted Central Europe, brought an unusually high amount of rain due to climate change, as two seas heated to unusually high temperatures, causing more water than usual to evaporate and the extra atmospheric moisture to bring extra rainfall. The cyclone arrived in the upper Danube basin with extremely heavy rainfall, which resulted in 63 per cent more rain in September than the long-term monthly average. The cyclone's heavy rainfall caused extreme river flooding on the Danube and storm damage at Lake Balaton, and the Hungarian government has estimated the damage at around HUF 5 billion[30], with the insurance sector having a major role to play in mitigating the damage. Looking ahead, if warming reaches 2 degrees Celsius above the pre-industrial levels in the 2050s, climate models predict even more severe consequences, such as

[23] Science Direct (Tamás Hajdu; 2024) Temperature exposure and sleep duration: Evidence from time use surveys
[24] The Economist (2024) Fewer babies are born in the months following hot days
[25] Spektrum.de (2024) Hochsommer und Nebenwirkung
[26] The New York Times (2024) Hot Summer Threatens Efficacy of Mail-Order Medications
[27] KSH (2024) The sowing area of the most important crops, 1 June 2024
[28] Növekedés.hu (Dániel Kovács; 2024) How much damage did the drought cause this year?
[29] magyarmezogazdasag.hu (2025) https://magyarmezogazdasag.hu/2025/03/27/a-karenyhito-tamogatas-jelentos-resze-az-aszaly-miatt-kerul-kifizetesre/
[30] The Government of Hungary (2024) The defense measures can soon end

4-day storms with at least 5 per cent more rain and 50 per cent more frequent than now.[31]

Droughts and heavy rainfall have a negative impact on biodiversity in Hungary. Biodiversity loss and the associated complex nature-related risks are among the top 3 priority risks in the short and long term, according to the World Economic Forum's latest annual Global Risks 2025 report[32]. Biodiversity contributes to the performance of the economy, and is linked to the environment on many fronts, whether it is fresh water, food production, pharmaceutical production, the prevention of epidemics or mitigating weather anomalies. The sudden cooling caused by last September's cyclone also had an unfortunate, and perhaps not so well-known side effect, as it came at the time of the bird migration. The incident caused a mass bird mortality, mainly among swallows, as the unusually cold weather forced them to stop before starting their migration[33]. The financial risks arising from biodiversity loss ripple through the entire financial system, for example, because the loss of bird species leads to an increase in pests and insects, which results in lower crop yields, which means higher commodity prices, affecting consumers, companies, creditors, insurers and ultimately price stability.

Meeting the energy needs of economic operators is a key task for all countries. Meeting the energy needs also raises the "energy trilemma", i.e. the crucial importance of energy affordability (energy prices that are rationally affordable for household and industrial users), the security of supply (availability of sufficient energy when needed) and sustainability (producing energy with the lowest possible, and further decreasing carbon emissions, moving towards net zero). The Government of Hungary adopted Hungary's National Energy and Climate Plan[34] in 2020, which was revised and updated in 2023-2024, due to the significant changes in the external environment of the Hungarian energy sector. Energy supply security and an increased energy sovereignty for the country have become a concern of national security, as such reducing the dependence on energy imports and reducing the ratio of natural gas in the energy mix are now an energy policy priority[35]. The extremely negative macroeconomic effects of the prolonged war between Russia and Ukraine, and the resulting European energy crisis (rising natural gas and electricity prices and supply uncertainties), highlight the need to transform the Hungarian economy towards energy independence, which has become an issue of national strategy. As Hungary has relatively low traditional fossil energy sources (oil, natural gas, coal), while its fossil energy import dependence is very high on Russia, the partial or full substitution of fossil imports will help to strengthen the country's energy independence and reduce its dependence on Russian imports.

The MNB examined the question of how to strengthen Hungary's energy independence. The MNB's "Green Power Action Plan"[36], developed in cooperation with the Zero Carbon Centre at the Budapest University of Technology and Economics, answers the question of how Hungary can achieve the renewable electricity generation targets set out in the current Energy Strategy for 2040, already by 2028, and what the national economic benefits would be. With the aim of reducing the use of natural gas, a new study was carried out in 2024 to examine possible ways of using geothermal energy.

Hungary is already a leader in the use of geothermal energy. By intensifying the use of this technology, an additional sustainable natural gas substitution of around 200 million m^3/year could be achieved by 2030. For comparison, the Békés gas field, which has been producing since February 2023, produced 78 million m^3 of natural gas last year, so more than one and a half times the amount of natural gas could be saved if geothermal energy is put to work even more. This is in line with the Hungarian government's geothermal strategy[37], which aims to double the current level of geothermal energy use by 2030. Geothermal energy can be used for heating/cooling in a classical district heating system, while shallow geothermal heat can be used for the heating of individual buildings, using ground source heat pumps. The use of geothermal heat is subject to geological and market risks, and in the district heating sector, it is also hampered by regulatory restrictions. Since geothermal energy technologies enable a form of renewable energy utilisation that requires high capital investment but has low variable costs, their widespread adoption is burdened by the users' liquidity constraints, and in some applications, uncertain return prospects. The use of geothermal energy can only

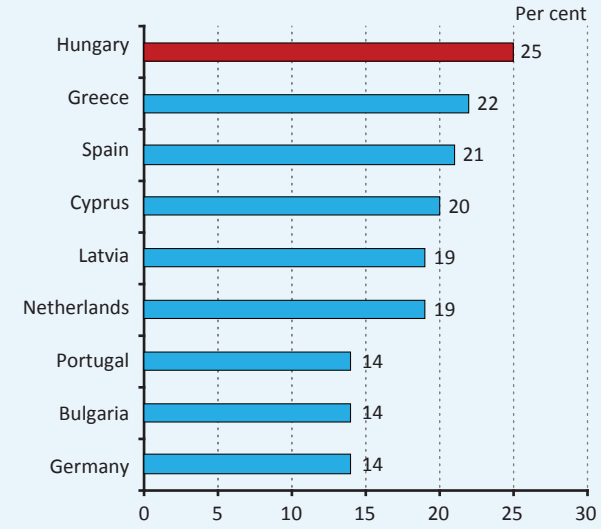
[31] World Weather Attribution (2024) Climate change and high exposure increased costs and disruption to lives and livelihoods from flooding associated with exceptionally heavy rainfall in Central Europe
[32] World Economic Forum (2025) Global Risks Report 2025
[33] Pénzcentrum (Szurok Dávid; 2024) Swallows are dying en masse across the country: what will happen to the population?
[34] The Government of Hungary (2023) Hungary's National Energy and Climate Plan – revised version
[35] The Government of Hungary (2023) Hungary's National Energy and Climate Plan – version revised in 2023
[36] BME-ZKK (2024) Series of articles on the results of the Green Power Action Plan
[37] Ministry of Energy (2024) National Geothermal Strategy

increase if these barriers are removed through coordinated government actions and well-targeted financial solutions. It is critical that support programmes not only stimulate demand but also include supply-side interventions, to avoid an adverse inflationary impact on the sector. However, from the point of view of a sustainable future, it is definitely worth investing in this technology, since there are already very good examples, for example in the area of district heating in Hungary, including cities like Győr, Szeged (the second city in Europe after Reykjavík, in terms of highest geothermal energy supply), and Miskolc.

Electricity generation turned greener in Hungary last year. Solar power continued to dynamically expand, with its share in the electricity generation rising from 18.4 per cent in 2023 to 25 per cent (Chart 1.6), making it the second largest source of electricity generation in Hungary. In the EU, only 16 countries produce more than 10 per cent of their electricity from solar panels, making Hungary the absolute leader in this field. Two-thirds of Hungary's solar power production comes from solar parks, and one-third from rooftop solar panels. In 2024, during the peak production period, solar energy was able to meet more than 80 per cent of the country's total electricity demand for over 70 days. This is a significant leap forward, especially for Hungary, where in 2023 there were only 10 days of peak power generation when 80 per cent of the domestic demand was met. [38]

In 2024, solar energy (25 per cent) and wind energy (2 per cent) provided more than a quarter of Hungarian energy generation. This ratio is roughly the same as the ratio of fossil power plants. Although total annual electricity consumption in Hungary (including grid losses) increased by 3.3 per cent to 48.17 TWh compared to 2023, this was against a 5.3 per cent increase in domestic electricity generation, to 37.44 TWh[39]. In the Hungarian energy mix, nuclear energy continues to dominate (43 per cent), and in the remaining 57 per cent, the share of renewable energy is already higher than fossil energy (Chart 1.7).

Chart 1.6
The share of solar energy in total EU electricity production in 2024



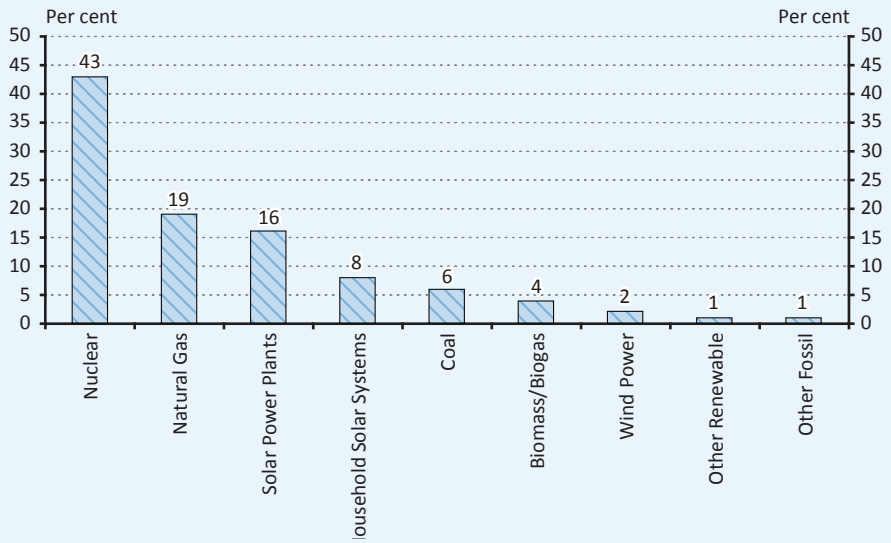
Source: Ember Climate

The transition to a sustainable economy is a priority for the MNB. This objective was reinforced by the Productivity Report, which focuses on catching up in a sustainable manner and on long-term growth, taking into account the megatrends of the current decade, one of which is green transition. The report helps to understand the drivers, characteristics, distribution, and dynamics of the key factors of economic growth and catching-up, and brings us closer to formulating and implementing reform proposals to improve productivity. It also provides a detailed analysis of the ecological efficiency of the Hungarian economy, among other things.

The MNB wants to set an example for the Hungarian financial sector, also through its own operations. The MNB was one of the first banks among the central banks worldwide and the Hungarian financial institutions to prepare a Climate-related Financial Disclosure (TCFD), which aims to identify, measure, and publish the climate risks related to the MNB's operational activities and financial assets in a transparent manner, covering a wide range of topics. One of the reasons for preparing the report is that the MNB considers the risks arising from climate change to be a system-level risk, the effects of which could have far-reaching consequences that could potentially have a negative impact on the MNB's primary and secondary objectives. The report assesses the climate risk exposures related to the MNB's balance sheet and its own operations and examines them according to the two main risk categories, transition risks and physical risks, and also by portfolios.

[38] Ember Energy (2025) European Electricity Review 2025
[39] Electric car operators (dr. László Papp; 2025) This is how Hungary generated electricity in 2024

Chart 1.7
Electricity generation in Hungary, 2024



Source: Edited by the MNB, based on MEKH data

Box 2
New indicators to measure sustainable development

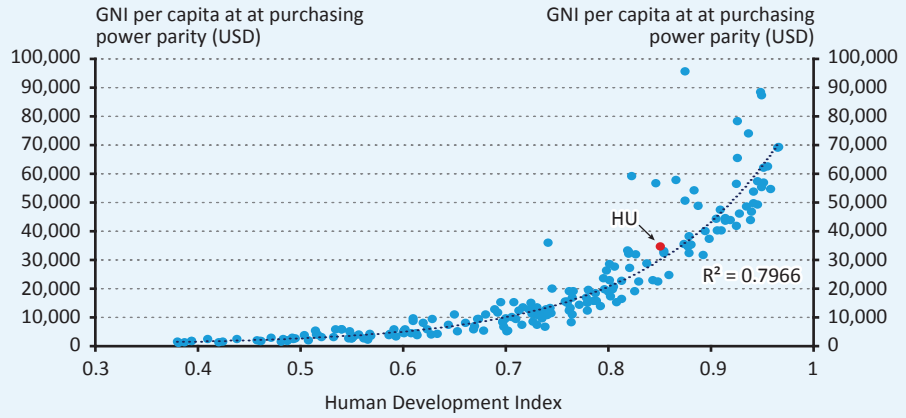
Due to its relative simplicity, gross domestic product (GDP) – the most commonly used indicator of economic performance—has limitations in capturing dimensions beyond economic well-being. A key insight from the article by Stiglitz et al.[40] is that what we measure affects what we do. If we measure the wrong thing, we will do the wrong thing. If we don't measure something, it becomes neglected, as if the problem didn't exist. While GDP is a reliable indicator of economic activity, it is not suitable for drawing conclusions about overall societal well-being.

Recognizing the limitations of GDP, experts at the MNB began exploring alternative indicators. This effort dates back to the 1970s, when doubts emerged about the sustainability of prevailing growth trends. Sustainability-oriented indicators can be divided into three groups: (i) inventory-type indicators, (ii) composite indicators and (iii) GDP-adjusting indicators. These vary in purpose, methodology, and output units. Inventory-type indicators track stocks of resources, capital, or assets over time, serving as proxies for sustainability. Two notable examples are the ecological footprint and biocapacity. Composite indicators aim to capture sustainability more holistically, incorporating factors such as economic performance, education, health, governance, and environmental conditions. However, a common criticism is that these indicators conflate diverse factors into a single index using subjective weighting methods, which can obscure interpretation – especially when environmental and social dimensions are merged with economic or subjective variables.

[40] Stiglitz, J.E. – Fitoussi, J.-P. – Durand, M. (2018): Beyond GDP: Measuring what counts for economic and social performance. OECD Publishing, Paris

One of the earliest and most well-known composite indices is the Human Development Index (HDI), introduced in 1990. It seeks to assess countries not just by economic metrics but by overall quality of life. According to the latest 2022 results, Hungary ranked 47th globally (Chart 1.8). Critics argue that the HDI reflects only a limited set of factors and is overly influenced by gross national income (GNI) per capita—a common issue with composite indices. GDP-adjusted indicators offer a balanced approach. These adjust traditional GDP figures by incorporating the monetized value of sustainability-related elements, producing a more nuanced picture of well-being.

Chart 1.8
The relationship between the Human Development Index and GNI per capita



Source: MNB (2024)

In line with international efforts, the MNB has proposed new sustainability indicators. In 2024, MNB experts introduced two such metrics, published in the Sustainable GDP – Global Discussion Paper[41]. The Sustainable Growth Index (SGI) is a composite indicator that measures sustainable development across EU countries using 64 indicators. It is built on five pillars, each contributing 20 per cent to the overall score: economic, financial, social, and environmental sustainability, plus GDP itself.

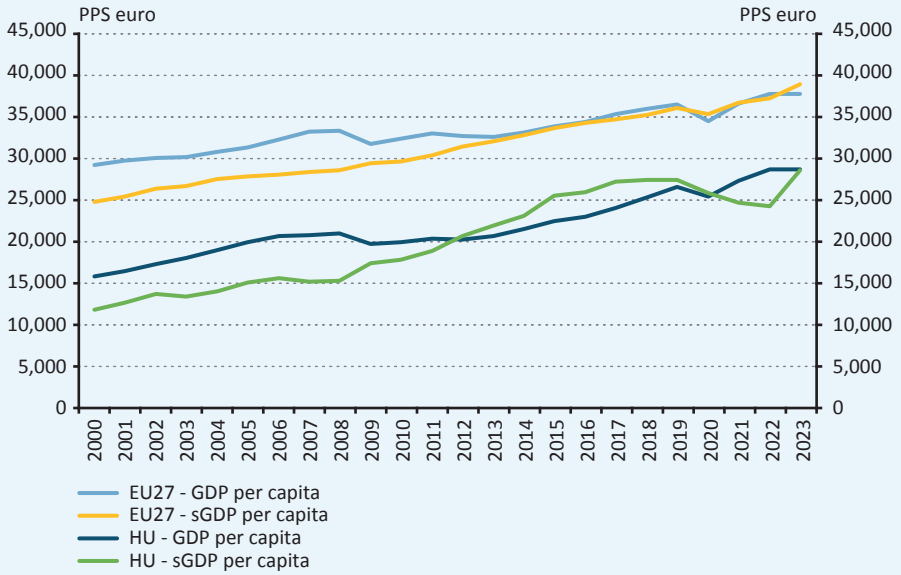
According to 2022 data, Hungary ranked 20th out of 27 EU member states. Notably, since 2010, Hungary has recorded the fourth-highest improvement in SGI. A key strength of SGI is its reliance on mostly objective indicators and a transparent weighting methodology. However, economic and financial dimensions still account for 60 per cent of the index, meaning strong performance in these areas can offset weaker environmental or social outcomes.

The second proposed metric is the Sustainable GDP (sGDP). According to the MNB's definition, "GDP is considered sustainable if it has been or could have been generated while preserving (i) the product and labour markets, (ii) the financial sector, (iii) the balance of external financing capacity and (iv) ecological resources, and (v) if it ensures a fair distribution of the goods and services produced." Each condition is represented by a key indicator, and sGDP is calculated by adjusting traditional GDP based on the values of these five components. The methodology, which uses relatively few inputs, ensures comparability across time and among all 27 EU countries.

[41] MNB (2024): Sustainable GDP – Global Discussion Paper

Based on sGDP, Hungary ranked 22nd among EU member states in 2023. Data shows that during the 2000s, Hungary's sGDP consistently lagged behind its GDP, indicating unsustainable growth. From 2012 onward, sGDP values exceeded GDP, suggesting that growth conditions had improved. However, in 2021 and 2022, sGDP once again fell below GDP due to the impact of various crises, before recovering to match GDP in 2023 (Chart 1.9). Compared to the EU average, in 2023, Hungary was ranked 22nd, and its relative position worsened compared to the beginning of the period. Within the Central and Eastern European region, the rankings were: Austria (6th), Czech Republic (10th), Poland (12th), Slovenia (13th), Romania (23rd), and Slovakia (24th).

Chart 1.9
GDP per capita and sGDP per capita in Hungary and the EU, 2000–2023



Source: MNB (2024)

In summary, there is still no universally accepted indicator to measure sustainability, which remains a key barrier to making it a policy priority. Encouragingly, the issue is gaining attention at the level of central banks—including the MNB—who are in a unique position to help resolve this measurement challenge.

2 The Measurement of Sustainability-Related Financial Risks, and Negative Impacts of the External Environment

Managing and measuring climate-related risks represents one of the most pressing challenges currently faced by financial institutions. These risks are characterized by their complexity, long-term nature, and differential impact across all sectors financed by the financial system. Moreover, the transition to a sustainable economy necessitates substantial investment, given the high costs associated with modernizing infrastructure, phasing out fossil fuels, and deploying novel technologies. Consequently, financial institutions and enterprises must devise strategies that effectively manage climate-related risks while maintaining long-term stability and competitiveness. By incorporating climate risk assessment into its regular supervisory activities, the MNB can enhance the resilience of financial institutions to climate-related threats. Such integration facilitates the shift towards sustainable business models and investment practices, thereby yielding positive outcomes for both the economy and the environment. The development and diffusion of low-carbon technologies – including renewable energy, energy storage systems, and carbon capture and storage – are crucial for achieving this transition. However, many of these technologies currently lack the required efficiency and scalability. Therefore, accelerating innovation, underpinned by robust climate risk forecasting and analytical tools, remains essential. Despite the continuous evolution of climate models, accurately predicting region-specific impacts continues to pose significant challenges.

In response to these issues, the MNB launched its Green Programme in 2019, with the objective of fostering an environmentally sustainable financial system. Within the framework of this programme, the MNB routinely assesses the financial sector's exposure to climate risks, covering both banks and insurance companies. The central bank also supports research initiatives dedicated to the measurement and management of such risks. In addition, the MNB regularly conducts both short-term and long-term climate stress tests. In 2024, the MNB evaluated the extent to which banks and insurers had aligned with its previously issued Green Recommendations. The objective was to enhance the resilience of supervised institutions and facilitate their transition to a net-zero emissions economy.

2.1 TRENDS IN THE BANK CARBON RISK INDEX

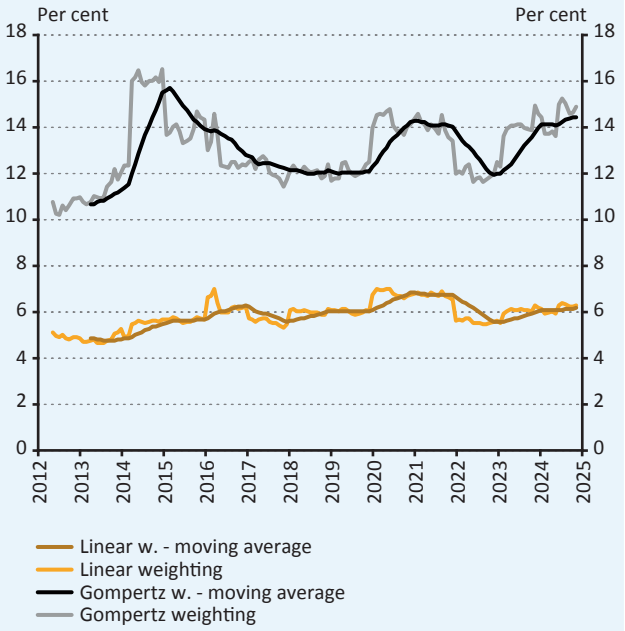
In 2024, the MNB's Bank Carbon Risk Index (BCRI) remained at the same elevated level observed at the end of 2023. The MNB has published the BCRI – an index designed to assess the climate-related risks within the Hungarian banking sector—since 2021. The indicator captures transition-related climate risks arising from corporate loan exposures through two distinct methodologies. The linear function assumes a direct relationship between GHG intensity and credit risk, positing that the greater the GHG intensity of a financed activity, the more susceptible it is to future climate mitigation policies. These anticipated regulatory pressures may adversely affect borrowers' financial performance. The strict regulations expected in the future could also affect the performance of borrowers. In contrast, the Gompertz function introduces a threshold-based interpretation, under which GHG intensity is considered negligible up to a certain point. Beyond this threshold, the risk sharply increases, and all activities above it are treated as equally exposed to climate risk.

The annual variation in sectoral GHG intensity significantly affects the index. Eurostat provides yearly updates on GHG intensity, measured as emissions per euro of value added (in grams), for each economic sector. The MNB refines these values by incorporating data from individual companies participating in the EU Emissions Trading Scheme. The BCRI is sensitive to newly published values, retrospective

revisions of historical data, and annual updates of company-level emissions information.[42]. Due to a 2.5-year delay in the release of Eurostat data, newly available figures can lead to revisions of not only the latest values, but also those of earlier periods.

Based on the stricter Gompertz methodology, 14.88 per cent of total domestic corporate loan exposures were classified as climate-risky at the end of 2024. This proportion is nearly identical to the 14.89 per cent recorded at the end of 2023, which marked the highest level since 2014 (Chart 2.1). For comparison, at the end of 2014, a record 16.51 per cent of corporate loans were deemed high-risk from a climate perspective. The persistently elevated value in 2024 suggests that the banking sector's climate-related credit risk has plateaued. While a decline in non-green exposures within the electricity sector contributed to a downward pressure on the index, this effect was counterbalanced by an increase in agricultural sector exposures (Appendix 1 and 2).

Chart 2.1
The banking system's monthly BCRI and annual retrospective moving average



Source: MNB

2.2 CLIMATE RISK MATRIX – A SNAPSHOT OF THE HUNGARIAN BANKING SYSTEM

Hungarian banks' climate exposures also stagnated on the basis of the Climate Risk Matrix. The matrix assesses banks' exposures through two distinct methodologies, considering both their corporate loan portfolios and holdings of corporate bonds and equities. The first methodology is based on the Climate Policy Relevant Sectors (CPRS) classification system, as outlined by Battiston et al. (2017)[43]. This approach categorizes the borrower's risk based on its principal activity. Of the nine CPRS groups identified, the first six are considered high-risk in relation to climate transition (CPRS 1-6 exposures): (1) fossil fuels, (2) utilities/electricity, (3) energy intensive industries, (4) buildings, (5) transport, and (6) agribusiness. As of January 1, 2025, revised EU legislation on principal economic activities (see Chapter 4, Box 9 for details) mandates a re-evaluation of CPRS classifications to align with the new legal framework. The second methodology, similar in logic to the BCRI, classifies exposures based on the GHG intensity of the borrower's principal activity. Exposures are grouped into six categories: (i) very low, (ii) low, (iii) medium, (iv) medium/high, (v) high and (vi) very high GHG intensity. Activities in categories (iv) through (vi) are considered most vulnerable to transition risks (GHG exposures). Under both methodologies, green exposures are treated as risk-free from a climate standpoint.

56 per cent of banking sector exposures fall within sectors affected by climate policy, while 45 per cent finance GHG-intensive activities. The buildings sector received the highest amount of non-green financing (HUF 3,715 billion), followed by transport (HUF 2,105 billion), energy-intensive sectors (HUF 1,376 billion), and agriculture (HUF 1,157 billion). Notably, the utilities/electricity sector is unique in that its green financing (HUF 495 billion) exceeds its non-green counterpart (HUF 458 billion)[44], a positive development considering this sector's historically high emissions profile. Among GHG categories, the "very low" GHG intensity group represents the largest share of non-green financing (HUF 4,505 billion), followed by the "high"

[42] In compiling the 2024 report, the BCRI employed 2021 GHG intensity values for 2021 and all subsequent years. For the 2025 report, the 2022 GHG intensity values were incorporated, which led to a downward revision of BCRI values for 2022 and later periods relative to previously published figures.

[43] Battiston, S. – Mandel, A. – Monasterolo, I. – Schütze, F. – Visentin, G. (2017): A climate stress-test of the financial system. Nature Climate Change, 7(4): 283–288. https://doi.org/10.1038/nclimate3255

[44] For the exposure values for each sector, the MNB's Green Finance Data Publication contains further information.

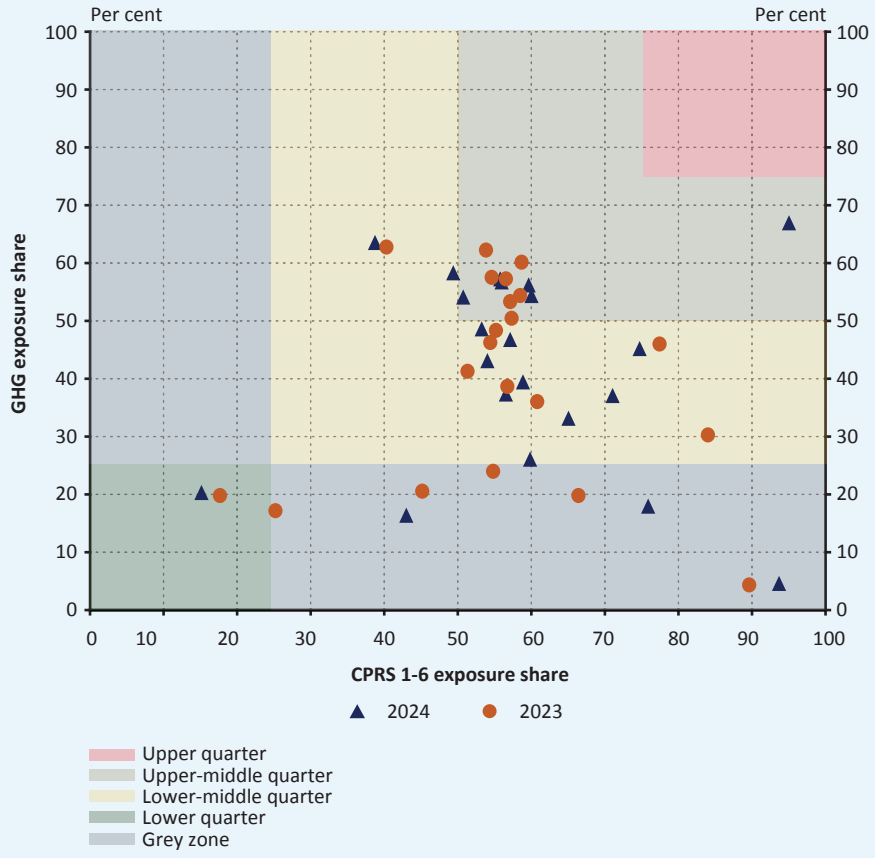
(HUF 3,758 billion), "medium/high" (HUF 3,323 billion), and "medium" (HUF 2,284 billion) categories. Exposures in the "very high" category remain relatively minor, amounting to HUF 281 billion.

58.6 per cent of the banking system was situated in the second-highest risk quartile (mid-upper quartile) of the Climate Risk Matrix. Based on the dual-method assessment, institutions are categorized into five groups: (i) upper quartile (highest risk), (ii) mid-upper quartile, (iii) mid-lower quartile, (iv) lower quartile (lowest risk), and (v) grey zone. Banks in the upper quartile are deemed most vulnerable to climate risks, while those in the lower quartile have minimal exposure. Institutions in the grey zone yield inconsistent results across the two methodologies, necessitating further examination. As of end-2023 and end-2024, no institutions were categorized in the upper quartile. However, the mid-upper quartile share increased slightly from 57.75 per cent to 58.58 per cent, while the grey zone decreased from 11.08 per cent to 6.95 per cent. The share of institutions in the mid-lower quartile also grew from 25.82 per cent to 28.92 per cent (Chart 2.2).

2.3 SHORT-TERM CLIMATE STRESS TEST

The MNB's 2024 short-term Climate Stress Test examines the resilience of the banking sector in a transition risk-related scenario. This stress test aims to measure the transition risks and identify which banks are the most vulnerable to the named risks among the 8 large and medium-sized banks participating in the test. This stress scenario assumes that a significant carbon price rise will hit Hungary, increasing the likelihood of bankruptcy for firms

Chart 2.2
The Climate Risk Matrix of the Hungarian banking system



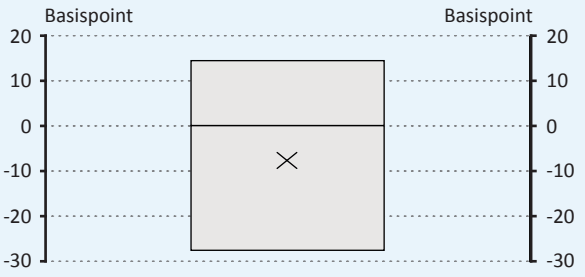
Source: MNB

with high GHG emissions. In this stress scenario, by the end of the 2-year test period, GDP levels are 4 per cent lower and household incomes are 9 per cent lower than in the baseline scenario. In the climate-related stress scenario, inflation is 5 percentage points higher after one year.

The outcome of this stress scenario on the domestic economy was similar to the outcome of last year's exercise. However, the results are below the values shown in the regular prudential supervisory stress tests. In this stress scenario, the probability of default (PD) values for companies are consistently higher than in the baseline scenario, for example, in the second year, they are 1.2 percentage points higher than in the baseline scenario. This increase in the probability of default is distributed differently across sectors. The methodology distributes the overall macroeconomic impacts across sectors in proportion to their GHG emissions, so that more polluting sectors face greater risks and less polluting sectors face fewer risks.[45]. The sectors most vulnerable to the transition are the energy and public utilities sectors. In their case, corporate PDs are 4 and 3 percentage points higher in the second year than in the baseline scenario. Green loans and loans to green companies identified from granular credit and customer-level information are only at increased risk due to the macroeconomic effects and are not affected by the transition-specific effects. At the sectoral level, property investments, commercial and intellectual activities and restaurants are less affected, as the exercise shows, due to their low energy and carbon intensity.

The results of this year's stress test again suggest that transition risks are not dramatically high in the balance sheet of the credit institutions. The bank-level effects were similar to last year's test, as the sectoral breakdown of the banks' portfolios did not change significantly over the past year. The average PD of loans of the bank that has a corporate loan portfolio most exposed to energy price changes increased by 15 basis points, due to the fact that its most exposed customers operate in energy-intensive industries (Chart 2.3). As in the previous year, banks will be subject to further impairment losses, given that loans to large corporates operating in carbon-intensive sectors typically have lower than average collateral coverage. Thus, due to the resulting higher LGDs (loss rates), this collateral effect increases impairment losses.

Chart 2.3
Impact of sectoral differences on the probability of default of the credit institutions' corporate portfolios



Note: The ranges show the minimum and maximum values, while X shows the median value for the given institution

Source: MNB

Transition risks have a particularly significant impact on the credit risk of the companies most affected. At the same time, all participants of the banking system remained stable over the period under review. The impact of transition risks on the banking system may be significant, but manageable.

From 2025, the MNB will assess the adequacy of the credit institutions' Climate Stress Tests as part of its review of the Internal Capital Adequacy Assessment Process (ICAAP). Under the MNB's Green Recommendation, credit institutions subject to the full SREP[46] are expected to carry out Climate Risk Stress Tests, which will be verified by the MNB. The MNB's audit will also cover the scenarios and quantitative models used, as well as governance aspects such as the form and frequency of the results presented to the management. The MNB will also examine the possibility of incorporating the results of the Climate Stress Test carried out by it, into its regular supervisory monitoring activities.

[45] For a more detailed description of the methodology, see the 2023 Green Finance Report and the following Financial and Economic Review paper
[46] Supervisory Review and Evaluation Process

Box 3
Data-driven analysis of the Green Preferential Capital Requirements Programme

The MNB has carried out a deeper analysis of the riskiness of the Green Preferential Capital Requirement Programme (GPCRP), with a larger data scope and advanced statistical methodologies. A significant part of the benefit provided under the GPCRP programme is based on the lower credit risk of green loans, which is therefore relevant for understanding the impact of the programme. Consequently, the MNB carried out a more detailed analysis of the probability of default of the companies included in the programme, based on the loan-level data of the credit register (HITREG) for 2020 to 2024, and the financial statements of the companies[47]. The analysis aims to compare the credit risk of green borrowers and companies that are similar in many respects, but do not meet the green criteria, while also controlling for the relevant risk factors. The analysis builds on the risk differences observed in the descriptive statistics, which are described in more detail in Chapter 2 of the 2024 Green Finance Report. The analysis is based on a data set including 890,000 observations and logistic regressions, and survival analysis methods.

Companies with renewable energy or electromobility loans participating in the GPCRP have a significantly lower risk of default compared to their peers. The results of the annual percentage point difference in risk of default, estimated by logistic regression, are shown in Table 1. Based on a logistic model with the most complete set of control variables, the annual probability of default is lower by 1.5-1.6 percentage points in these segments. According to the survival models, the default risk of companies linked to green loans is 40-70 per cent lower than that of comparable companies, depending on the specifications of the model. In addition, models that include green variables consistently predicted lower credit risk for sustainable companies than models that ignored the companies' participation in the Green Programmes.

Table 1
The relationship between green indicators and the companies' probability of default, estimates

	(1)	(2)	(3)	(4)	(5)
GPCRP – Renewable energy	-2.0%	-2.2%	-1.4%	-1.6%	-1.5%
GPCRP – Electromobility	-1.9%	-2.0%	-2.0%	-1.8%	-1.6%
Financial controls	No	No	No	No	Yes
Loan controls	No	No	No	Yes	Yes
Sector control	No	No	Yes	Yes	Yes
Company characteristics controls	No	Yes	Yes	Yes	Yes
Missing data control	No	Yes	Yes	Yes	Yes
Quarter fixed effect	No	Yes	Yes	Yes	Yes
County fixed effect	No	Yes	Yes	Yes	Yes
Number of observations	890,872	890,872	890,872	890,872	618,916

Note: The table shows the percentage point estimates of the annual impact of the GPCRP green variables on the reduction in probability of default for an average company. Among others, the financial control variables: leverage and liquidity ratio, ROA after tax, revenue to asset ratio; Loan control: elapsed and remaining maturity, collateral value, contract size, currency; Company characteristics controls: how long the company has been in operation, size.[48]

There might be several reasons for the risk differential of companies with renewable energy production and electromobility loans. In the field of renewable energy production, significant supportive policy measures have been implemented in Hungary, such as the subsidised feed-in tariffs, the mandatory feed-in tariff (KÁT) and the METÁR (renewable support system). Subsidised renewable energy companies can generate steady revenues with little

[47] Várgedő, B., Burger, Cs., Kim, D. (2025): Green Firms Are Less Risky: Results from a Preferential Capital Requirement Programme in Emerging Europe, MNB WP 2025/2 WP 2025/2- Bálint Várgedő-Csaba Burger-Donát Kim: Green Firms Are Less Risky: Results from a Preferential Capital Requirement Programme in Emerging Europe | MNB.hu

[48] Based on Várgedő et al. (2025)

fluctuation in cash flows, which may be the theoretical reason for the lower default risk outcome. This theory is in line with a robustness check, in which the risk is also shown to be lower for the KÁT-METÁR subsidised renewable energy companies. Favourable policy measures are also applied for companies with e-mobility loans (vehicle tax and company car tax exemptions, parking fee reductions), but these have a smaller impact. In their case, it can be assumed that other factors, such as self-selection (companies with a higher status tend to buy sustainable vehicles), or the ESG or environmental conscious attitudes of the companies, are more important.

According to our results, about half of the 5 to 7 per cent rate reduction granted under the Green Preferential Capital Requirement Programme (GPCRP) can be directly justified by empirical credit risk differences. With the simplified Vasicek model, it can be shown how the risk differential corresponds to the preferential capital requirements, so that it is possible to measure how much of the preferential capital formation is justified historically. When compared to average companies, the risk differential-based capital effects are 3.4 and 3.1 percentage points for renewable and electromobility-related companies, respectively. Compared to companies that are similar in many respects to the given companies but do not have green loans, the capital requirement effects are smaller for renewable energy companies (2.1 percentage points), but similar for electromobility companies (3.3 percentage points). When assessing the size of the benefit granted under the GPCRP, it is worth to also consider the expected future increase in transition risks and the fact that the GPCRP only provides a benefit for 5 consecutive years on the exposures, so portfolios with longer maturities will on average have a significantly lower discount over the full maturity. Thus, while the benefit used goes beyond a purely historical risk-based approach, the lower risk of sustainable loans may provide a plausible argument for the preferential capital requirements overall.

2.4 THE OECD BIODIVERSITY PROJECT

Accelerating biodiversity loss is a major risk for the economy and the financial sector. However, measuring these impacts is much more complex than measuring the risks associated with climate change. Measuring temperature or the air concentrations of pollutants is straightforward because the measuring instruments are available but measuring an insect population that is constantly changing in time and space is much more complicated. There is still little, but growing, knowledge of the risks to the financial sector from biodiversity loss worldwide. This can lead to an underestimation of the risks, inaccurate market pricing, inappropriate allocation of capital, and overall, to an increased exposure to these risks, with losses that even threaten social welfare. Therefore, policymakers, financial supervisory authorities and central banks need to assess the implications of these risks and possible ways to address them more thoroughly than they have done so far.

In September 2022, the MNB launched a research and methodology project to assess the financial risks of biodiversity loss. The cooperation, which fits well into the MNB's Green Programme (launched as part of its supervisory authority activities), was funded by the EU through the Technical Support Instrument (TSI) for about two years, with the OECD participating as an advisor in the implementation process, in cooperation with the European Commission's Directorate-General for Structural Reform Support (DG Reform). The research project was thus a joint collaboration between three actors. This innovative initiative by the MNB has further strengthened its leadership position in the area of sustainability among the central banks.

The research project had useful results not only for Hungary but also for other countries.[49] The 22-month collaboration resulted in a comprehensive analysis of the overall biodiversity-related financial risk assessment and measurement options, which was published in April 2023. The document outlined the types of biodiversity risks and transmission channels, the available databases and methodologies, and the key challenges. Another document was also prepared, specifically for central banks and financial supervisory authorities, in which a supervisory framework was developed and its applicability to the Hungarian economy was assessed. These findings were presented at an international conference organised by the MNB and OECD to mark the end of the research project.

The results of the project highlight the complex relationship between the Hungarian loan market and ecosystem services. A central element of the research,

[49] The Biodiversity Project of the MNB and OCED, with the support of the European Commission

which was based on the 2022 year-end Hungarian data, was linking the loan data and the sectoral trade data with the pollutant groups and ecosystem services, using the ENCORE database.[50]

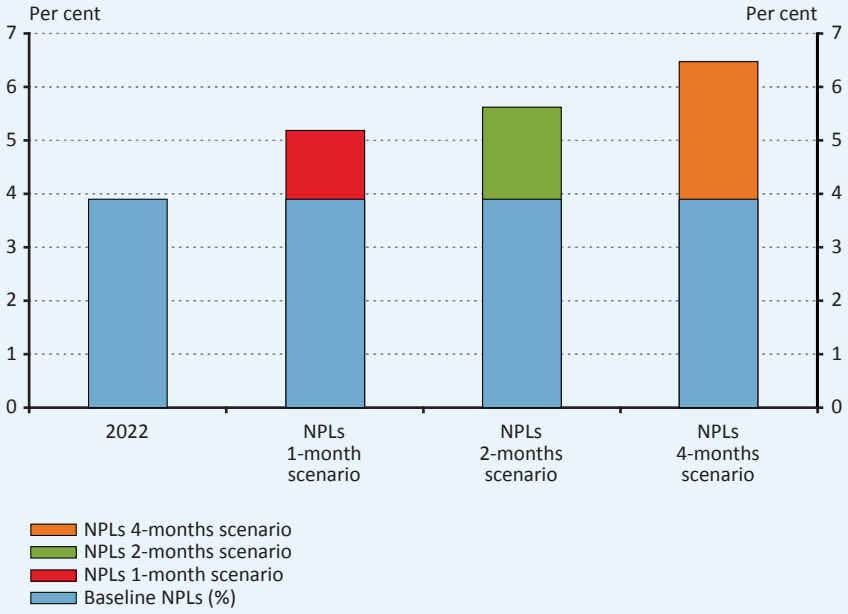
The results of the research show that the vast majority of Hungarian corporate loans are linked to an ecosystem service. The research highlighted several strong links and severe potential risks, one of which is that around three-quarters of the Hungarian corporate loans are linked to at least one ecosystem service. Furthermore, the Hungarian banking system is highly exposed to physical risks in sectors that are heavily dependent on surface and groundwater. Thus, it seems that the country's water sources are proving to be a particularly important resource in this respect as well. As expected, agriculture is the most exposed sector in Hungary, but the processing industry has the greatest impact on the ecosystems (Chart 2.4).

According to the OECD results, a severe drought scenario would also have a strong impact on the non-performing loan (NPL) ratio. In the scenarios, a 1-month, 2-month and 4-month decline is assumed in the economic performance of the affected sectors, due to an extremely severe drought. The calculation, which is based on the 2022 year-end economic situation and data, suggests that a severe drought would naturally increase the ratio of non-performing loans, but this increase would not be extreme, given the stability of the economy and the banking system (Chart 2.5).

Chart 2.4
The sectors most exposed to and most affected by ecosystem services in the Hungarian economy

Source: OECD (2024): Assessing nature-related risks in the Hungarian financial system: Charting the impact of nature's financial echo

Chart 2.5
Ratio of non-performing loans in Hungary under severe drought scenarios, based on 2022 year-end data



Source: OECD (2024): Assessing nature-related risks in the Hungarian financial system: Charting the impact of nature's financial echo

[50] Exploring Natural Capital Opportunities, Risks and Exposure

2.5 RESULT OF THE BACKTESTING OF THE GREEN RECOMMENDATION FOR INSURERS

The MNB issued its Green Recommendation for Insurers ("Recommendation") in December 2023. Prior to its entry into force in 2025, the MNB also assessed the preparedness of the insurance sector through a large-scale assessment methodology, based on gap analysis and face-to face consultation. The analysis shows an encouraging picture of the preparedness of the Hungarian insurers but also highlights the need for further action. As mentioned, a summary of the Recommendation and its main contents is available in the Green Finance Report 2024. The Recommendation on the implementation of environmental sustainability considerations in the activities of insurers is a pioneering initiative at a European level as, in addition to the banking sector, which is most often in the spotlight, now also provides a guidance for the sustainability transition of domestic insurers.

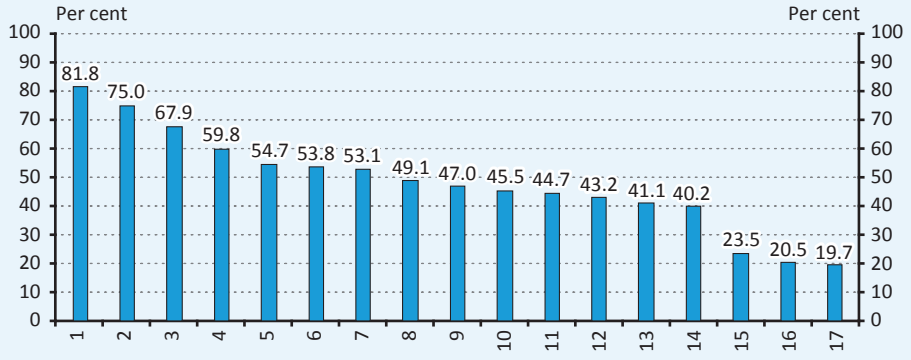
The MNB has provided a self-assessment template for the insurers to assess the gap analysis. The template contains a set of questions on compliance with the key points of the Recommendation, divided into four main themes (business model and strategy, corporate governance, risk management and disclosure). It is important to note that for each question, institutions were required to attach the relevant documentation (including measures or plans) for verification purposes. Based on the responses and the documents submitted by the insurers, the MNB quantified the preparedness level, considering the proportionality principle.

The level of the preparedness of institutions was mixed six months before the Recommendation came into force. The most prepared insurers had already fulfilled around three-quarters of the recommendations at the time of the gap analysis, while some institutions were only at the beginning of the preparatory work (Chart 2.6). Of the four main topics of the Recommendation, institutions are most prepared in the area of risk management, while most of the work to be done is in the area of disclosure (Chart 2.7).

The key to greening business strategy is to effectively map the relevant climate risks. A methodology for identifying climate risks is already in place in most domestic institutions. It is also typical that larger groups with international interests have already focused on sustainability issues and have developed a group-wide strategy. The relevant strategy aspects then need to be adapted by the subsidiaries to the local conditions. However, several institutions indicated that the requirements of the group-wide strategy for subsidiaries were not yet available at the time of filling in the questionnaire, so that they were not yet in a position to incorporate the expectations of the Recommendation into their strategy documents.

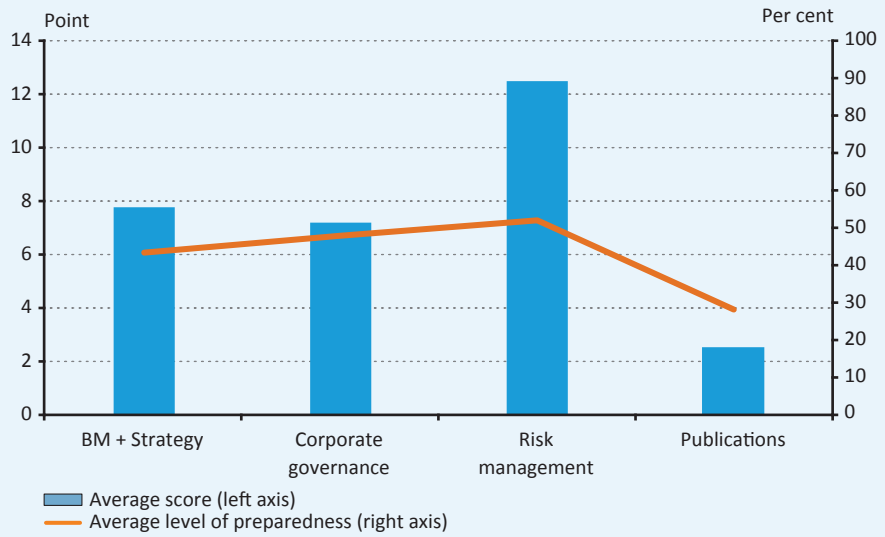
A common element of sustainable corporate governance practices is the clear definition of the roles and responsibilities. It also involves and updates the relevant areas and management bodies. Most insurers have set up a department responsible for sustainability issues or appointed a responsible person or manager. In several (typically smaller) institutions, sustainability work is carried out with a project-based approach, i.e. there is a contact person for sustainability issues in each relevant department, who represents their unit in the organisation's sustainability-related projects. A good example of the practice of informing the management bodies and involving the risk management area is to involve the sustainability project team, the data disclosure area, the risk management area and the management bodies in the information flow, by holding regular meetings.

Chart 2.6
Aggregated institutional compliance with the green insurance recommendation



Note: Related insurers are listed as one institution
Source: MNB

Chart 2.7
Average scores grouped by topic



Note: The maximum score for each topic: Business model and strategy – 18 scores; Corporate governance – 15 scores; Risk management – 24 scores; Disclosure – 9 scores

Source: MNB

Most insurers have started to assess and quantify the physical risks associated with climate change. This has typically been done using the methodologies provided by their parent companies. Domestic insurers have added a sustainability section to their ORSA report, where they could assess their climate risks both qualitatively and quantitatively. In terms of assessing the transition risks, the focus was on the insurers' investments, while the assessment of transition risks related to products and partners were less frequent. This was partly due to interpretation problems, which were resolved by oral consultations. The review of legal and reputational risks is documented only by a few institutions, but it is informally available at the institutions, i.e. they focus on it, even if not documented.

Currently, the biggest gap in the sector is in the area of disclosure. The lack of disclosure-related measures is partly explained by the subsidiary status mentioned above, which affects the majority of the domestic insurers. These institutions typically provide data to the parent company for group-level sustainability reporting, which is then reflected in the consolidated reports, but information by subsidiary is typically not available. This is because subsidiaries of large groups preparing integrated reports are not legally required to prepare sustainability reports, so the disclosure requirements of the Recommendation are typically not met for these institutions. In this context, it is a good practice for the institution to still disclose some form of sustainability information, specifically related to the domestic subsidiary, for example on a dedicated website. Such relevant information may include, for example the insurer's domestic GHG emissions, a description of its green investments, information on climate risk mitigation for customers, as well as a brief description of the sustainability risks relevant to the insurer and the measures taken to address them.

2.6 RESULT OF THE BACKTESTING OF THE GREEN RECOMMENDATION FOR BANKS

In October 2024, the MNB surveyed the domestic banking sector, using its own questionnaire. Through the survey, the MNB assessed the banks' preparedness and level of compliance with the requirements of MNB Recommendation No. 10/2022 (VIII.2.) on climate change and environmental risks, and the integration of the environmental sustainability aspects into the activities of credit institutions[51]. The MNB provided a self-assessment template to the banks, which focuses on five areas: business planning, corporate governance, risk management, the lending process and other topics (e.g. data provision for the supervisory authority, operational activities, disclosures). The documents supporting the banks' self-assessments were reviewed by the MNB, and where necessary, adjustments were made to the self-assessment scores

[51] MNB Recommendation No. 10/2022 (VIII.2.)

based on a quantitative methodology. The highest score was given in case of full compliance with the Recommendation effective from 1 January 2025.

In the field of business planning, the banking sector's average compliance level with the requirements of the Recommendation was 63 per cent. Broken down by size, the average for large banks was 67 per cent, while the average for small and medium-sized banks was 57 per cent. Banks with an international parent bank have more elaborate methodologies and documents and are governed by a strict framework. In general, banks have incorporated the ESG considerations into their business planning processes and the related strategies, but to a varying degree. Some banks were still in the early stages of identifying the environmental risks affecting their activities when the survey was carried out, while other banks that were further ahead had already developed strategies through a materiality and scenario analysis. Some banks are already conducting materiality analyses, and good banking practices include the incorporation of KPIs and KRIs related to material climate change and environmental aspects into their strategies.

In the field of corporate governance, the banking sector's average compliance level with the Green Recommendation was 80 per cent. The average for large banks was also higher in this segment, at 83 per cent, while the average for small and medium-sized banks was not much lower, averaging 77 per cent. Most banks have a dedicated ESG department or manager, and most banks provide sustainability training for managers, although this is not yet mandatory for all employees in many banks. Generally speaking, reports and analyses presenting ESG issues and risks are prepared for the bank's management bodies, which are then used in decision-making and strategy formulation. The MNB considered it a good practice that some banks have assigned incentive and remuneration elements to the ESG-related objectives.

In the field of risk management, the banking sector's average compliance level with the Recommendation was 59 per cent. The average for large banks was 65 per cent, while the average for small and medium-sized banks was only 50 per cent, so this is the area where there is the most room for improvement, contrary to the insurance sector, which performed best in this area. Banks are integrating climate change and environmental risks into their existing risk categories, rather than defining them as a separate risk type. The majority of the banks analyse and monitor ESG risks and their impact on their activities in the form of periodic reports, and some banks already carry out stress testing and scenario analysis for environmental risks as a good practice, but the methodology for taking ESG and climate risks into account needs to be improved, due to the relative novelty of the topic.

In the field of the lending process, the banking sector's average compliance level was 72 per cent. The average for large banks was 77 per cent, while the average for small and medium-sized banks was 65 per cent. For most banks, the lending proposals already include information on the environmental risk and ESG assessment of the transactions/clients, although the depth and quality of this information vary. For most banks, there is still little automation in the ESG assessment in the lending process, and they often use questionnaires to assess their clients. Only a few banks offer favourable terms for green and energy efficiency loan purposes, thereby recognising such goals in their pricing, but as a good practice, banks monitor and regularly track the achievement of the climate and environmental targets set out in their strategy.

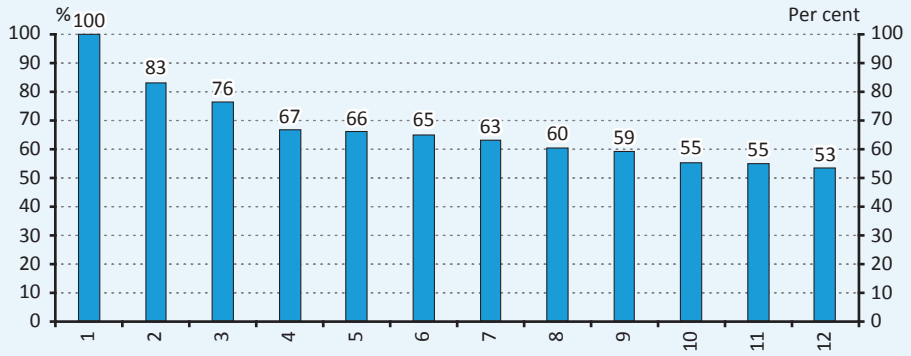
In other areas, the credit institution's average compliance level was 64 per cent. The average for large banks was 71 per cent, and the average for small and medium-sized banks was 53 per cent. Banks are filling the data gaps needed to manage the environmental risks associated with their various data disclosure by using external and internal data sources, but the data taxonomy for climate and environmental risks, and the climate and environmental risk data themselves are still not available in the banks, and their proper collection or generation still poses difficulties. Most banks are trying to assess the environmental impact of their operations, and mitigating this impact is usually included in their ESG strategies. The banks are backtesting these results again, which may justify further changes and refinements to the previous strategies. Good practices include preparing a sustainability report on the bank's activities and including in their disclosure policy how the bank assesses the materiality of the climate and environmental risks.

The MNB requires institutions to publish the climate change-related data, indicators and targets. Credit institutions have a responsibility to provide market participants with comprehensive information on their climate and environmental risks and risk profile. At the EU level, several regulatory measures have been adopted in

the field of disclosure: the Capital Requirements Regulation (CRR)[52], the Corporate Sustainability Reporting Directive (CSRD)[53], and the Sustainable Finance Disclosure Regulation (SFDR)[54], which are presented in detail in Chapter 4.4. Institutions are obliged to publish their information in accordance with these regulations.

All players of the domestic banking system have taken significant steps to comply with the requirements of the Green Recommendation for Banks. However, banks show a varying level of preparedness, and it appears that most banks (regardless of their size) still have room to increase their level of compliance (Chart 2.8). The self-assessments prepared by the banks are confirmed by the MNB's assessment, with one bank already meeting all the requirements of the Green Recommendation, which came into force on 1 January 2025, and four other banks are being similarly prepared in terms of certain sections not yet in force at the time of completing the survey, so their MNB assessment also improved. For five banks, the MNB agreed with the self-assessment results, while for two banks, the MNB revised the self-assessment scores downwards, as the underlying documentation did not fully support compliance with certain requirements. The survey also found that large banks, due to their size, available resources and, in most cases, strong parent bank background and framework, have on average stronger compliance and preparedness (73 per cent) than small and medium-sized domestic banks (60 per cent) for meeting the requirements of the Green Recommendation

Chart 2.8
The banks' level of preparedness in complying with the requirements of the Green Recommendation



Note: Bank 1 complied with the sections of the Green Recommendation that will enter into force on 1 January 2025 already in 2024
Source: MNB

[52] Regulation (EU) 575/2013 of the European Parliament and of the Council
[53] Directive (EU) 2022/2464 of the European Parliament and of the Council
[54] Regulation (EU) 2019/2088 of the European Parliament and of the Council

3 Green Finance: Barriers and Incentives

A significant barrier to achieving a climate-neutral economy lies in the constraints on available resources. The transition cannot proceed without substantial private sector engagement; thus, the proliferation of green financial products and investments is imperative. As the proportion of sustainable assets on financial institutions' balance sheets rises, associated transition risks are mitigated. In response, the MNB has introduced a suite of initiatives aimed at advancing green financial instruments. Among these, the Green Preferential Capital Requirement Programme has proven particularly effective, catalysing a rapid expansion in green asset exposure. This programme has been complemented by a range of targeted sustainability-related financial product developments.

Although green lending has exhibited positive growth trends, green investments did not show a comparable increase in 2024. While the green exposure of household and corporate lending has grown, the number of green mutual and insurance funds has remained largely static. To address this stagnation, the MNB introduced tools such as the Green Financial Product Finder and updated its SFDR Q&A in 2025. The latter aim to reduce regulatory uncertainty and clarify supervisory expectations, thereby supporting institutions in progressing toward sustainability objectives.

Beyond financial incentives, the MNB actively recognizes and rewards institutions leading in the area of green finance. At the 2024 Green Finance Conference, awards were conferred to the most exemplary actors: Raiffeisen Bank Zrt. received the Green Bank Award, Allianz Hungária Biztosító Zrt. received the Green Insurance and Pension Fund Award, and Amundi Befektetési Alapkezelő Zrt. was recognized with the Green Investment Fund Manager Award.

3.1 THE TRENDS SEEN IN GREEN LENDING

3.1.1 The Extension of the Green Preferential Capital Requirements Programme

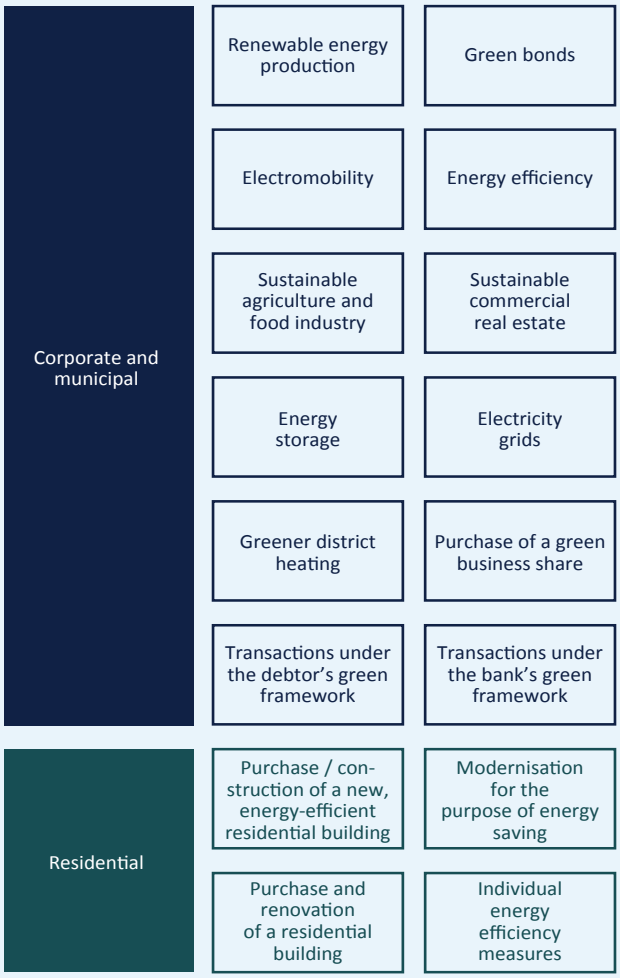
In November 2024, the MNB decided to extend the Green Preferential Capital Requirement Programme (GPCR) for an additional year. The GPCRP is designed to mitigate transition risks by incentivizing the expansion of green asset exposures. By fostering a more favourable financing environment, the programme supports the green transition efforts of both corporations and municipalities. Moreover, by facilitating the financing of environmentally certified properties, it contributes to the reduction of household-level emissions. Under the extension, financial transactions contracted up to 31 December 2026 will remain eligible for inclusion in the programme[55].

The rationale for the programme's extension rests on prudential grounds. Firstly, green loans exhibit a lower probability of default relative to their non-green counterparts, a differential that supports preferential regulatory treatment for green exposures (see Box 3 and Box 5 for more information). Secondly, data collection under the GPCRP has proven instrumental in refining climate risk analytical tools. Additionally, the MNB assessed the impact of the GPCRP on the capital adequacy of participating financial institutions. The findings indicate that these institutions maintain capital positions significantly above the minimum regulatory thresholds—even in the absence of the preferential capital treatment—demonstrating the financial robustness of the participating entities.

The programme's continuation is further substantiated by its incentive structure. The MNB evaluated the extent to which credit institutions utilized the GPCRP and found that no institution approached the maximum theoretical benefit. The highest utilization rate remained below 30 per cent, suggesting ample capacity for growth. This underutilization highlights the programme's ongoing relevance and its potential to further stimulate the expansion of green loan portfolios.

[55] The information documents and the related information on the GPCRP programme can be found at the MNB's Green Finance website.

Chart 3.1
Environmentally sustainable financing loan purposes of the MNB's GPCRP

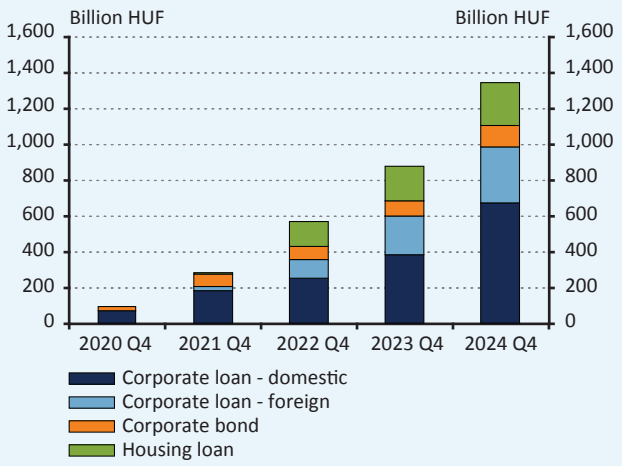


Source: MNB

The GPCRP has also undergone an expansion in terms of eligible asset types. In the corporate exposure category, the programme now includes green bonds issued in accordance with the EU Green Bond Regulation[56]. Additionally, corporate bonds issued by Hungarian non-financial entities abroad – provided they fund environmentally sustainable economic activities – are eligible. Effective from 31 January 2025, these changes are also intended to support the financing of other, non-climate change-related environmental objectives of the EU Taxonomy Regulation. The MNB has launched various initiatives to promote green housing finance. One notable effort involves enhancing the Certified Consumer-Friendly Housing Loan framework by extending the preferential capital requirement period from five to ten years. Participating banks must offer these loans at an interest rate discount of at least 50 basis points, compensated by the extended regulatory benefit. Furthermore, the MNB has simplified the reporting requirements for green housing loans linked to specific energy efficiency improvements, thereby encouraging growth in this loan segment. The eligible purposes under the GPCRP are illustrated in Chart 3.1.

As of end-2024, the total volume of green exposures included in the GPCRP exceeded HUF 1,345 billion[57]. This figure reflects a 54 per cent increase compared to end-2023, with growth observed across all exposure categories—particularly in domestic corporate and municipal loans and foreign green corporate loans (Chart 3.2). The value of green exposures in the programme is calculated with the outstanding principal amount for loans, and with the fair market value for bonds. Domestic corporate and municipal exposures dominate the programme (HUF 670.82 billion), followed by loans to foreign entities (HUF 316.24 billion) and green housing loans (HUF 241.96 billion). While the volume of banks held green bonds issued by Hungarian non-financial corporations increased to HUF 116.64 billion, further expansion is constrained by the limited issuance of new green bonds.

Chart 3.2
Developments of green exposures involved in the GPCRP



Note: Loan exposures are shown based on the outstanding principal amount, while bond exposures are shown based on fair market value.

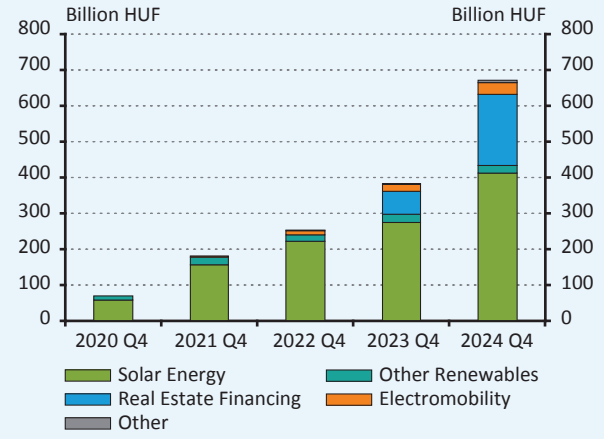
Source: MNB

[56] EU Green Bond Regulation

[57] More information on the MNB's GPCRP programme's Charts and other green financial data can be found in the MNB's quarterly Green Data Publication.

A significant portion of domestic green corporate and municipal loans finance renewable energy production. Solar energy accounts for the largest share (HUF 411.63 billion, 61.36 per cent), followed by geothermal energy (HUF 15.23 billion, 2.27). The second-largest category comprises sustainable commercial real estate with high energy performance (HUF 197.43 billion, 29.43 per cent). Electromobility-related financing represents HUF 33.21 billion (4.95 per cent) (Chart 3.3).

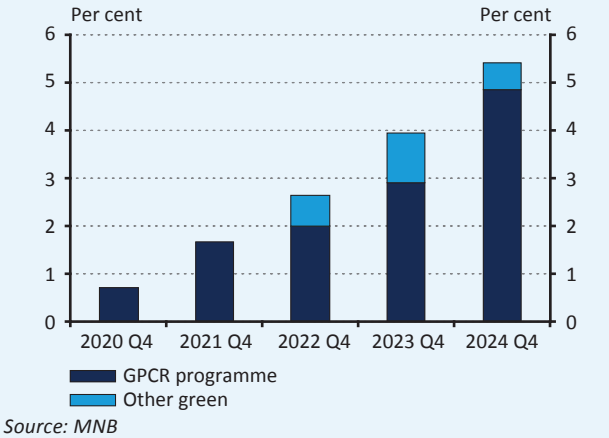
Chart 3.3
Distribution of domestic corporate and municipal exposures in the GPCRP by loan purpose



Source: MNB

By the end of 2024, the share of green domestic corporate and municipal loans reached 5.40 per cent. A substantial portion of these exposures were linked to the GPCRP (Chart 3.4). Other green loans include exposures affected by infrastructure support factor, or taxonomy aligned loans, or Baross Gábor green loans, or a combination of these. The largest annual increase in the share of green loans (1.47 percentage points) occurred between the end of 2023 and 2024. By renewing the GPCRP, the MNB aims to further support the financing of the green transition.

Chart 3.4
Share of green domestic corporate and municipal credit exposures

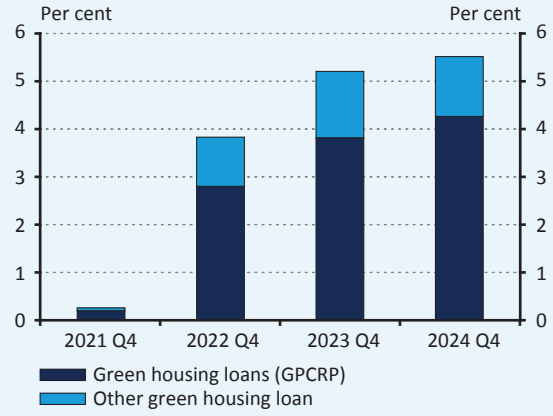


Source: MNB

3.1.2 Green Preferential Capital Requirements Programme for Housing Loans

The volume of green housing loans has also continued to grow steadily, reaching a market share of over 5.5 per cent by end-2024. Within the GPCRP's housing loan category (Housing GPCRP), the outstanding volume amounted to HUF 241.96 billion—an increase of more than 26 per cent year-on-year. Green housing loans outside the GPCRP[58] totalled HUF 70.74 billion at the same point in time. Combined, these segments comprised 5.53 per cent of the total Hungarian housing loan market (Chart 3.5), reflecting a 0.31 percentage point increase. The overall housing loan portfolio expanded by 12.82 per cent during 2024, reaching over HUF 5,655 billion.

Chart 3.5
Share of green housing loans, 2021–2024



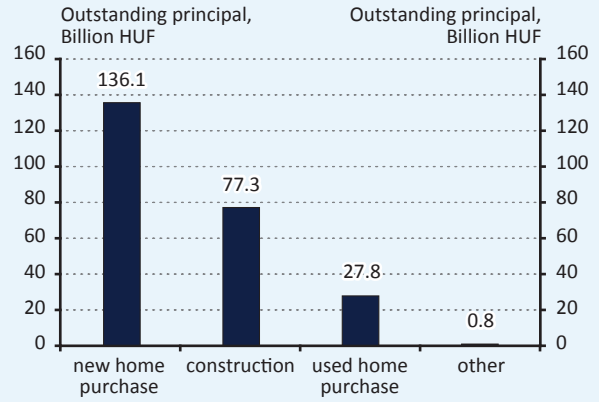
Source: MNB

The Housing GPCRP is predominantly used for financing new home purchases and construction. Eligible loan purposes include: the purchase or construction of new, modern energy-efficient homes, the renovation of outdated properties, and the implementation of energy-efficiency upgrades. The majority of loans were directed toward new home purchases (HUF 136.07 billion) and new home construction (HUF 77.29 billion) (Chart 3.6). Existing green-compliant properties accounted for a smaller share

[58] Other green loans are exposures that are not part of the Housing GPCRP, but green home programme loans, or taxonomy aligned loans, or certified consumer-friendly green housing loans, or a combination of these.

(HUF 27.76 billion), likely due to the limited availability of such homes. In 2024, new renovation loans targeting the energy efficiency upgrade of existing homes were introduced. These include financing for modernisation efforts that result in an energy performance rating of at least "A," or achieve a minimum 30 percent reduction in primary energy demand. In the case of pre-1990 properties, renovation eligibility is simplified by waiving the requirement for proof of pre-renovation conditions. Currently, Housing GPCRP loans may finance either a 30 percent improvement in energy demand or the upgrade of pre-1990 properties.

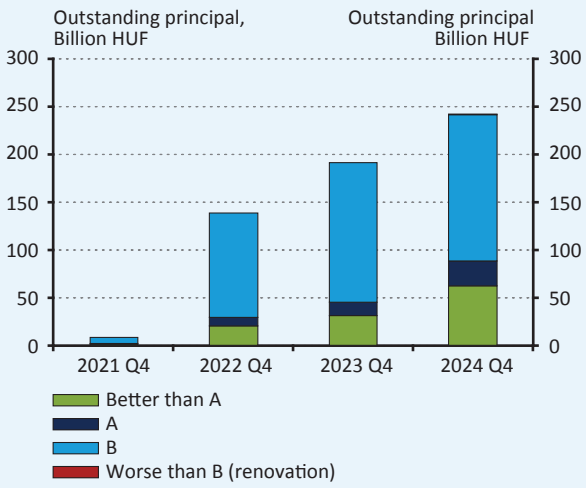
Chart 3.6
Distribution of transactions in the Housing GPCRP by type of real estate financing



Source: MNB

The majority of properties financed through the Housing GPCRP are rated "B." By end-2024, "B"-rated property loans totalled HUF 153.35 billion (Chart 3.7). This was previously the minimum level to be reached to be eligible for the programme. Due to tightened programme requirements, a growing number of transactions achieved an "A" rating (HUF 26.10 billion) or even higher ("A+" to "A+++" ratings accounted for HUF 62.50 billion). Loans supporting renovations with at least 30 per cent energy savings may have ratings below "B," although these constitute a negligible share (HUF 0.01 billion).

Chart 3.7
Distribution of transactions in the Housing GPCRP, by the energy rating of the financed property[59]



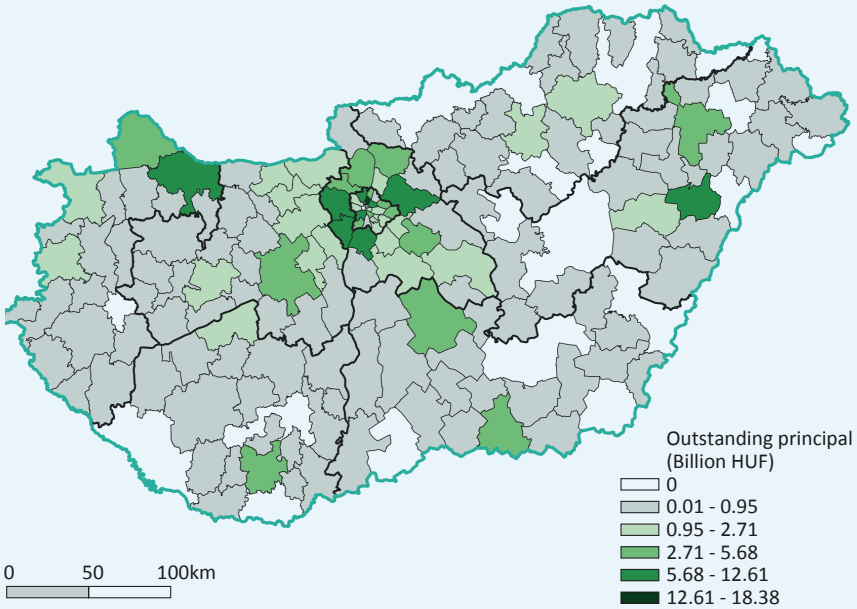
Note: A rating better than "A" is understood to be: "A+++", "A++" and "A+" ratings according to the ÉKM Regulation, and "AA++" and "AA+" ratings according to the TNM Regulation. "A" rating also includes "AA" rating under the TNM Regulation. "B" rating also includes "BB" rating under the TNM Regulation.

Source: MNB

Over 70 percent of Housing GPCRP transactions were concentrated in Budapest and Pest County, particularly in Districts XIII, XI, and XIV. Beyond Budapest, green housing loans exceeded HUF 8 billion in areas such as Gödöllő, Debrecen, Érd, Budakeszi, and Győr. The spatial distribution of green housing finance closely aligns with patterns of new home construction (Chart 3.8).

[59] Based on outstanding principal

Chart 3.8
Distribution of transactions in the Housing GPCRP by district based on outstanding principal at 2024 year-end



Source: MNB

Box 4
Energy demand estimation and analysis for financed residential real estates

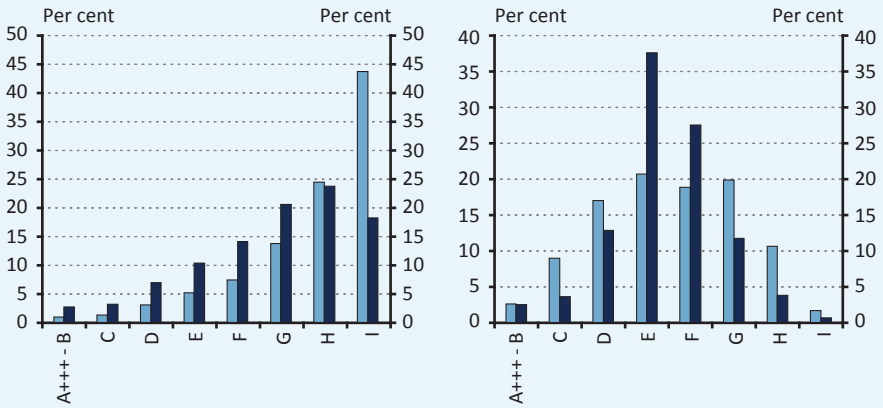
The residential sector has historically accounted for a substantial share of Hungary's total energy consumption – ranging between 32 and 40 percent over the past 35 years since the political regime change. Therefore, the housing market plays a critical role in achieving Hungary's climate targets. Improving the energy performance of the domestic housing stock not only contributes to climate mitigation goals but also enhances national energy security and independence. From a financial stability perspective, the distribution of mortgage portfolios by energy performance is relevant, as climate change-related transition risks are higher for properties with poor energy efficiency. Given that mortgages comprise a substantial proportion of bank balance sheets and housing assets represent the largest component of household wealth, the energy profile of the housing stock is of systemic importance.

To enable comprehensive analysis, energy performance data must be available for both the entire housing stock and the bank-financed segment. A recent study (Ritter and Várgedő, 2025)[60] aimed to fill this gap by estimating the energy efficiency of properties serving as collateral for housing loans. Currently, primary energy demand (PED) data is available for less than 40 percent of the mortgage portfolio. To address this data limitation, the researchers applied two estimation methodologies – Ordinary Least Squares (OLS) and the Random Forest algorithm – using collateral-, instrument-, and customer-level data. The results indicate that the Random Forest method provides superior predictive accuracy and is thus better suited for portfolio-level energy efficiency estimation when the PED is missing.

[60] Renátó Ritter – Bálint Várgedő (2025): Where to renovate? Estimating the energy demand of financed residential properties using machine learning, *The future of money, money of the future*

The findings reveal that family houses with outstanding housing loans tend to have significantly better energy performance than the national housing stock. According to estimates by Bene et al. (2023)[61] and Csoknyai et al. (2025)[62], nearly 90 percent (approximately 2.5 million units) of the total family house stock fall into the four lowest energy classes (F, G, H, I) (Chart 3.9). In contrast, among loan-financed family houses, this share is "only" 77 percent (approximately 300,000 units). For condominiums, however, the gap between the energy profiles of the overall stock and the financed segment is narrower.

Chart 3.9
Estimated distribution of energy ratings. Estimates for family houses (chart on the left-hand side) and condominiums (chart on the right-hand side), according to the certification system in force since 2023.



Source: Based on Ritter and Várgedő (2025) and Csoknyai et al. (2025)

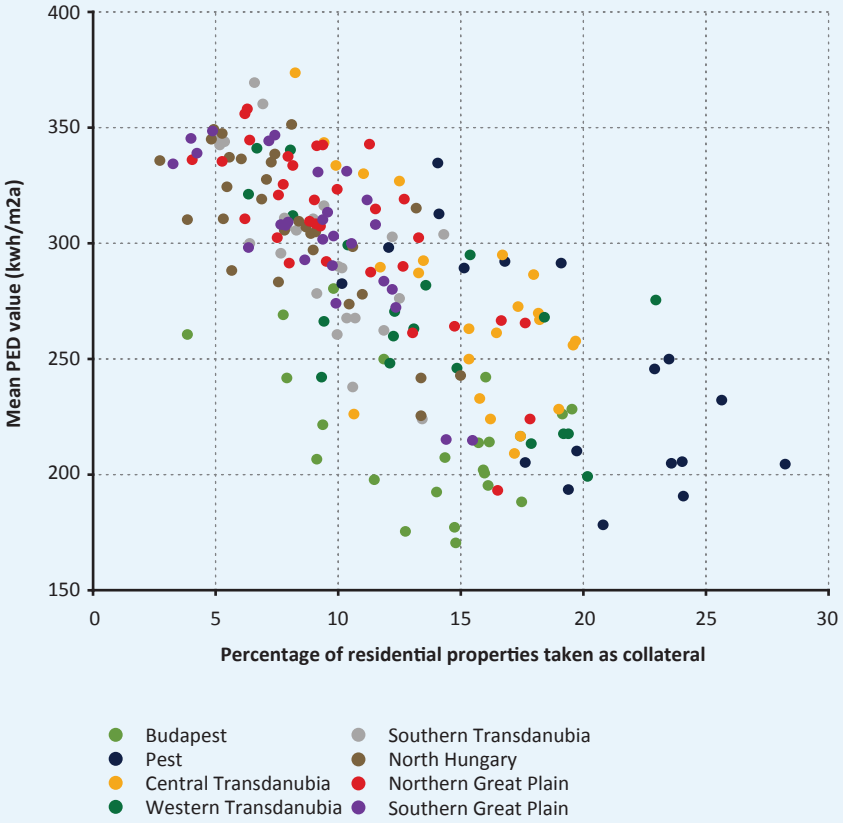
There is also considerable regional and property-type variation in energy performance. The average PED of loan-financed family houses ranges between 149 and 384 kWh/m^2/year depending on the region, while that of condominiums is slightly lower, between 146 and 319 kWh/m^2/year. The most outdated, energy-inefficient family houses are located in the Southern Transdanubia, Northern Great Plain, and Southern Great Plain regions. Similarly, condominiums with the highest energy needs are concentrated in the Southern Transdanubia, Southern Great Plain, and Northern Hungary regions Chart 3.10).

A clear relationship is observed between a region's average energy performance and the prevalence of mortgage financing. Regions with lower PED – i.e., higher energy efficiency – tend to have a greater share of loan-financed properties (Chart 3.10). In areas with average PED around 300 kWh/m^2/year, the share of financed properties typically ranges between 3 and 14 percent. In more efficient regions, this proportion often exceeds 20 percent and even surpasses 25 percent in some areas of Pest County.

[61] Mónika Bene, Antal Ertl, Áron Horváth, Gergely Mónus and Judit Székely (2023): *Estimating the energy demand of the housing portfolio in Hungary* Hitelintézeti Szemle, 22 (3). pp. 123-151. DOI 10.25201/HSZ.22.3.123

[62] Tamás Csoknyai – Áron Horváth – Miklós Horváth – Judit Székely: The consequences of legislative changes on the energy classification of residential buildings, part 2; Magyar Épületgépészet, volume LXXIV, issue 2025/1-2

Chart 3.10
Share of loan financed properties based on average PED, each dot represents a region



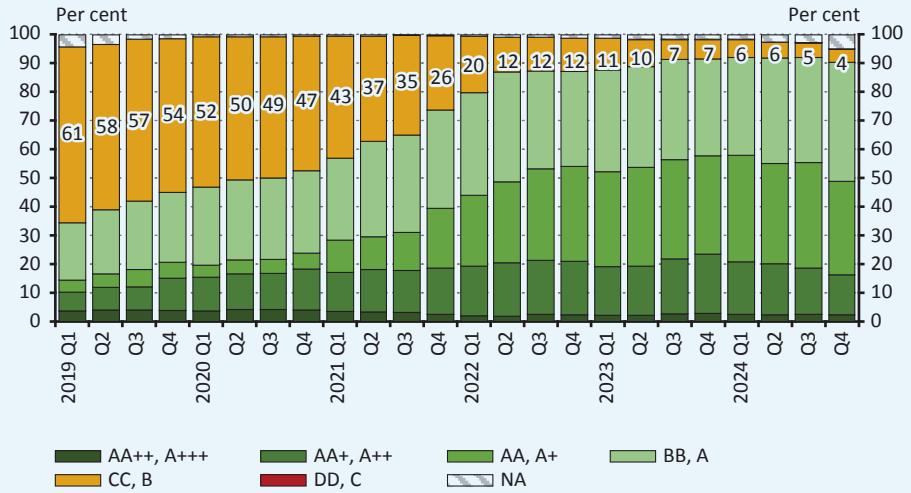
Source: Ritter and Várgedő (2025)

The estimates confirm that properties financed through credit institutions tend to be more energy-efficient than the broader housing stock. Moreover, there is a noticeable lack of mortgage financing in regions with the worst energy performance. The research identifies Northern Hungary and the Great Plain regions as those with both low energy efficiency and limited access to financing. The divergence in energy quality between financed and non-financed properties is particularly stark for family houses, whereas the gap is smaller for condominiums. These findings underscore the importance of regulatory and financial measures aimed at upgrading the energy performance of the existing housing stock.

3.1.3 Energy Efficiency in the Hungarian Property and Loan Market

More than half of the apartments in new condominiums in Budapest have an energy efficiency rating better than the near-zero energy demand (NZE) requirement. According to the current regulation governing the energy performance requirements of buildings in Hungary, new buildings applying for occupancy permits after 30 June 2024 must meet the near-zero energy demand (NZE) standard, i.e. they must achieve at least an "A" rating (formerly "BB"). The energy efficiency of the new apartment market in Budapest has improved significantly in recent years. While in 2020 only half of the apartments under sale met the NZE requirements, by 2024 this ratio had risen to 92 per cent (Chart 3.11). More than half of the new dwellings under development and for sale in Budapest in 2024 were in a category better than the expected "A" rating (formerly "BB"), compared to only one-fifth in 2020. High energy efficiency properties can be associated with both small and larger projects (over 500 properties), and from 2020, a significant increase in the ratio of high energy efficiency properties was observed across Budapest.

Chart 3.11
Distribution of flats in new condominium projects under sale in Budapest by estimated energy rating



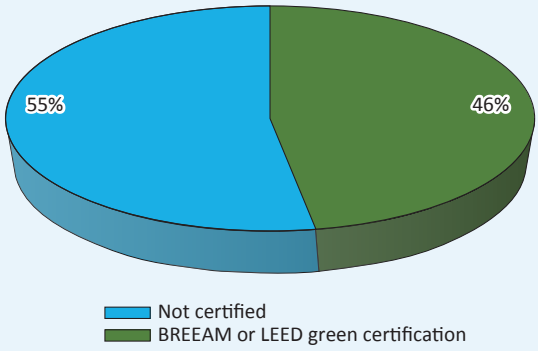
Note: Based on 4-flat or larger condominiums. From 1 November 2023, energy classificatons have changed. The estimated energy categories include both the old and new energy classifications. Marked in green are nearly zero energy consumption or better categories. Where the energy efficiency is unknown, we used category BB or A for renewable energy, and category CC or B for all other.

Source: ELTINGA – Housing Report, MNB

At the end of 2024, the modern Budapest office stock amounted to 4.46 million m². Nearly half of this is considered environmentally green. Based on the BREEAM and LEED ratings of the Budapest office portfolio, which have an environmental focus, and excluding thereof most of the plan-based pre-certifications prior to completion, as at year-end 2024, 46 per cent of the office portfolio (over 2 million m²) was considered green (Chart 3.12). A further 10 per cent is pre-certified under a green certification system.

The focus of the ratings varies. The BREEAM and LEED ratings are environmental ratings, while WELL is a rating based on the community-based assessment of buildings[63]. 4 per cent of the Budapest office portfolio has a WELL rating with a focus on social aspects, and some of these buildings have also achieved an environmental rating. All submarkets in the Budapest office market have green office space, with the majority concentrated in the Váci út office corridor, in the Central Pest, in the South Buda and Central Buda submarkets, as there have been significant volumes of new development in these submarkets in recent years. Based on the current development projects, around 460,000 m² of new office space (10 per cent of the existing market at the end of 2024) will be completed in the next two years, and when they are handed over, the share of green office space in Budapest will be further increased.

Chart 3.12
Composition of the modern office stock in Budapest according to green rating



Note: The green-certified office stock includes modern office buildings in Budapest with BREEAM or LEED certification, pre-certifications are taken into account only for buildings completed in the previous one-year period. Data from end-2024.

Source: CBRE

In terms of tenant needs, the importance of the sustainability of office buildings is becoming more pronounced among prospective tenants. According to CBRE's European-wide survey published in July 2024[64], 83 per cent of the responding tenants cited the sustainability features of office buildings as a key factor in their rental decision. In 2023, this rate was 55 per cent, in 2022

[63] For more details on green building ratings, see Box 1 of the October 2021 Commercial Real Estate Market Report. Available at: https://www.mnb.hu/letoltes/commercial-real-estate-market-report-october-2021-eng.pdf

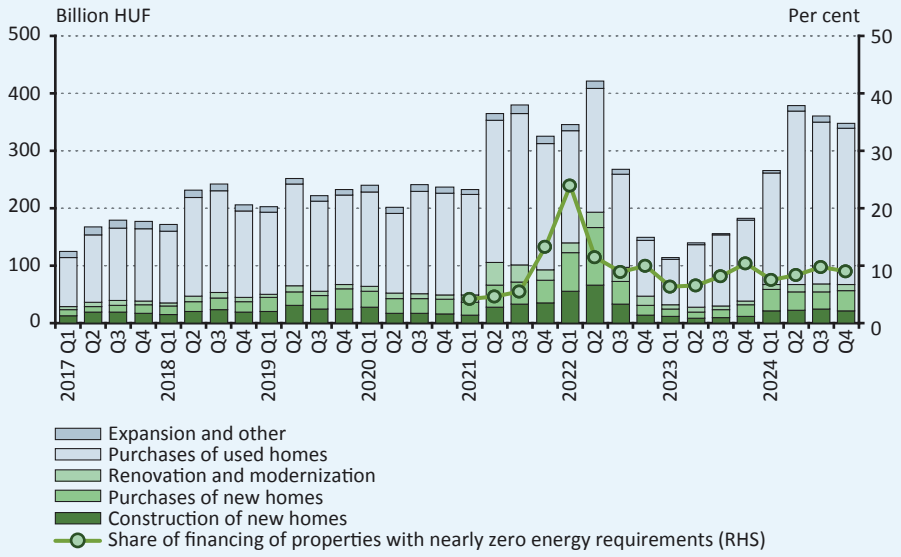
[64] CBRE Research: European Office Occupier Sentiment Survey, July 2024.

it was 44 per cent, and in 2021 it was 37 per cent. The CBRE survey also shows that 83 per cent of the companies surveyed have made a net-zero pledge through their public communication. In terms of timing, 44 per cent of the companies with a net-zero pledge plan to reach their target by 2030.

The share of loans for energy-efficient new homes remains low. In 2024, the new disbursement of housing loans by the credit institution sector was HUF 1,350 billion, 128 per cent higher than in 2023. The increase was observed for all housing purposes. In 2024, 133 per cent more loans were taken out to buy a new home than a year earlier (Chart 3.13). Loans for the purchase of used homes continue to represent the largest volume, with a 78 per cent ratio, and total new disbursements increased by 132 per cent year-on-year. This major increase was driven by the home purchase subsidies extended in January 2024 (with an HPS Plus contract size up to HUF 50 million), and also by the fact that reducing housing loan interest rates supported the housing market demand. Rising contract size has thus contributed significantly to the expansion of volume. The average contract size of housing loans was HUF 19.5 million in December 2024, compared to HUF 13.2 million a year earlier. In 2024, the ratio of green housing loans within the total housing loan disbursement increased year-on-year, but is still considered low, with less than 20 per cent of all housing loans financing the purchase of a home with near-zero energy needs, i.e. with an energy rating of "A" or higher.

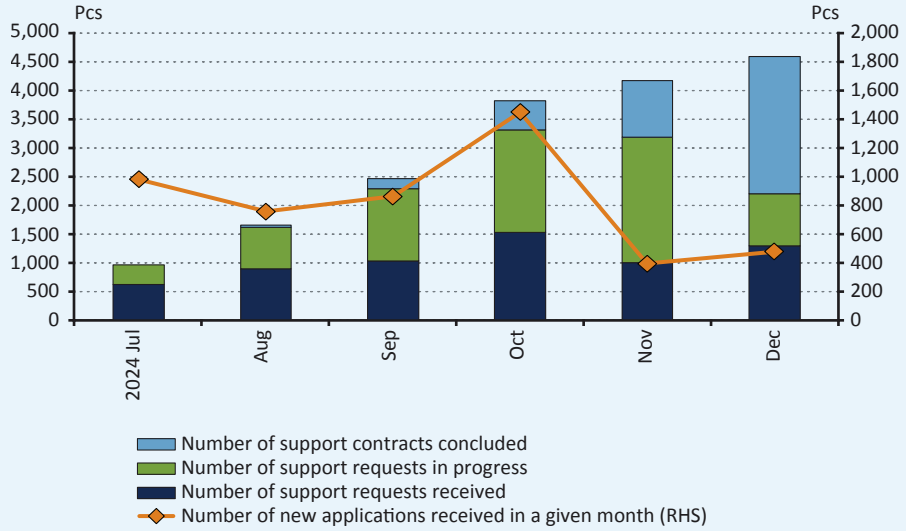
Based on the loan contracts signed in the first six months of the Home Renovation Loan Programme, a total of HUF 16 billion investment is planned to be carried out. The Home Renovation Loan Programme is available from 1 July 2024, for the energetic modernisation of family houses built before 1990, intending to achieve at least 30 per cent primary energy savings. Up to December 2024, a total of 4,906 loan applications were submitted under the programme, and for half of them, the loan contract is already signed (Chart 3.14). Regarding the grant contracts already signed, the total average cost of investment was HUF 6.8 million, of which financing amounted to HUF 5.5 million, of which the average non-repayable grant was HUF 3.2 million. The vast majority of the grant contracts signed during the 6-month period, around 55 per cent of them, are for the insulation of facades and ceilings, 25 per cent are for heating modernisation, and 19 per cent are for replacing windows and doors. Based on the applications received, the total volume of energy efficiency investments planned under the programme is HUF 27 billion. As part of the New Economic Policy Action Plan, which includes 21 measures, the Government launched the Rural Home Renovation Programme on 1 January 2025, which is not linked to energy efficiency investments, but the maximum HUF 3 million non-repayable grant available under the programme also supports such modernisation.

Chart 3.13
Distribution of newly disbursed housing loans by loan purpose



Note: Taking into account the new energy classifications of November 2023.
Source: MNB

Chart 3.14
Cumulative number of home renovation support requests and the development of new applications



Note: Requests in progress represent applications that have been registered but not yet positively assessed, and applications that have been approved but not yet contracted.

Source: Hungarian Development Bank

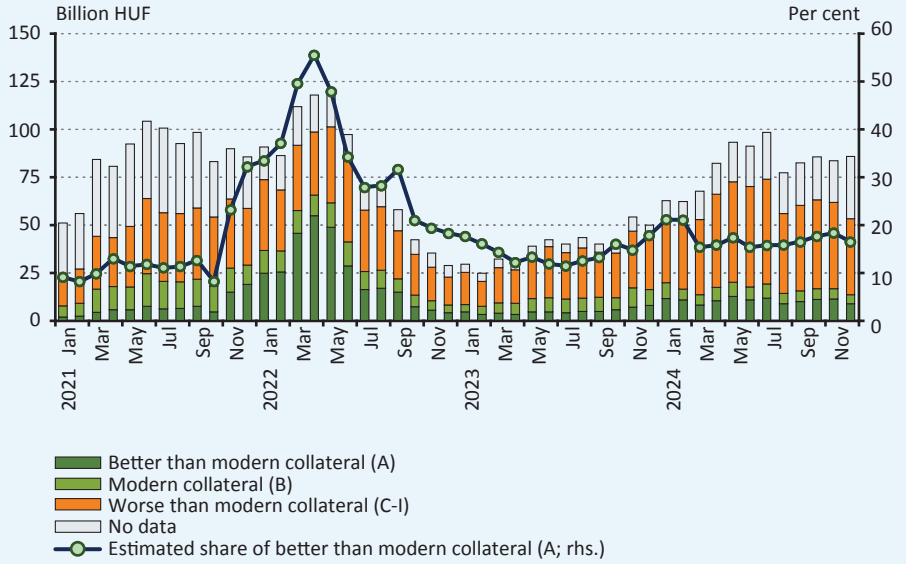
Box 5
The MNB strengthens green lending to households through borrower-based measures

The MNB is seeking to promote the financing of energy-efficient home purchases and renovations by amending its borrower-based measures, which aim to mitigate the systemic risks of household sector lending in a risk-neutral manner. The energy efficiency of mortgage-financed properties has not improved significantly since 2021, except for properties financed under the Green Home Programme (GHP). Among the new housing loan disbursements, the share of properties provided as collateral with an energy performance certification higher than modern is low: it has remained stable between 10 and 20 per cent since 2021 (with a rating of at least "BB", according the rating system applied until October 2023, and a rating of at least "A", according to the current rating system), with that their ratio was temporarily nearly 50 per cent during the Green Home Programme period (Chart 3.15). This suggests that there is still considerable room for growth for green mortgage lending.

The so-called Green Hypothesis suggests that financing energy-efficient buildings may have a lower credit risk. Lower maintenance costs allow borrowers to spend a larger share of their income on loan repayments, which means they can have a lower probability of default (PD). In addition, the market demand for green properties may be more shock resistant compared to less energy efficient properties, meaning that these properties keep their value better, which means lower Loss Given Default (LGD) for lenders. The first Hungarian studies on the Green Hypothesis are already available, supporting that it might be valid in Hungary as well[65]. The difference identified for the corporate sector is discussed in more detail in Chapter 2.3.

[65] See the research by Hajnal at al. (2022), and Ertl at al. (2021) on the price premium associated with energy efficiency improvements in family houses. For a Hungarian study on the lower probability of default for loans with better energy-efficiency property collaterals, see the MNB Green Finance Report (2022) pp. 86-88, for international research see the EC-EEFIG (2022), Billio et al. (2022) summaries

Chart 3.15
New housing loan disbursements, by the energy performance certificates of the financed properties



Note: Based on the new energy ratings applied from November 2023. Data is missing due to having no Energy Performance Certificate data available during the home purchase process, and data quality.

Source: MNB

A green differentiation of borrower-based measures could support the renewal of the domestic housing stock without excessively increasing risks. A growing body of empirical research confirms that the risk of mortgage loans for green properties may be lower, and that the effectiveness of borrower-based measures varies substantially, depending on the energy efficiency of the property. In view of this, applying more favourable borrower-based measures to green properties and loans for green purposes could support the take-up of green lending without increasing systemic risks.

From 1 January 2025, the MNB introduced more favourable debt-service-to-income ratios (DSTI) and loan-to-value ratios (LTV) for green property purchases and home renovation loans. Under the new rules, for HUF mortgage loans that meet the conditions set for green collateral and green loan purposes in the Green Preferential Capital Requirement Programme, with fixed interest rates for at least 10 years, the LTV limit has been increased to 90 per cent. In parallel, for qualifying loans, the applicable DSTI limit was set at 60 per cent, regardless of customer income.

Table 3.1
LTV and DSTI limits applicable from 1 January 2025

LTV limits

Category		HUF	EUR	Other foreign currency
Mortgage loan	First-time home buyers	90%	50%	35%
	Green collateral and green loan purpose			
Financial leasing	First-time home buyers		55%	40%
	Green collateral and green loan purpose			
Mortgage loan	Other borrowers	80%	50%	35%
Financial leasing		85%	55%	40%
Car purchase loan		75%	45%	30%

DSTI limits (HUF loans)

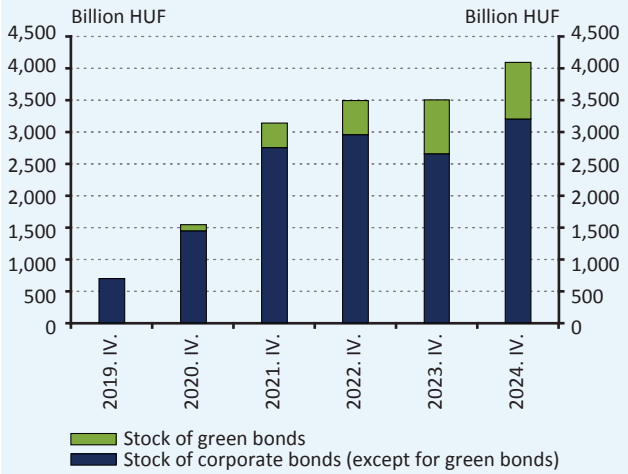
Category	Mortgage loan by interest-rate period			Other loans or mortgage loans with a maturity of less than 5 years
	Less than 5 years	5 to 10 years	10 years or longer, or fixed	
Monthly net income is less than HUF 600,000	25%	35%	50%	50%
Green loan purpose			60%	60%
Monthly net income is over HUF 600,000	30%	40%	60%	60%

3.2 GREEN CAPITAL MARKET

3.2.1 Green Corporate Bond Market

The stocks of outstanding traditional and green corporate bonds have both increased in 2024. The size of the corporate green bond market has grown each year since the emergence of this product type in Hungary. The trend continued in 2024, which is encouraging given that the *Bond Funding for Growth Scheme* (BGS) launched by the MNB, ended in 2022. In 2024, the size of the corporate bond market reached HUF 4 trillion at nominal value, of which green bonds accounted for over 21 per cent, nearly HUF 900 billion (Chart 3.16). Overall, 162 corporate bond issues took place between 2020 and 2024, of which 26 series were green rated.

Chart 3.16
Green and traditional bonds, issued by non-financial companies, at nominal value



Source: MNB

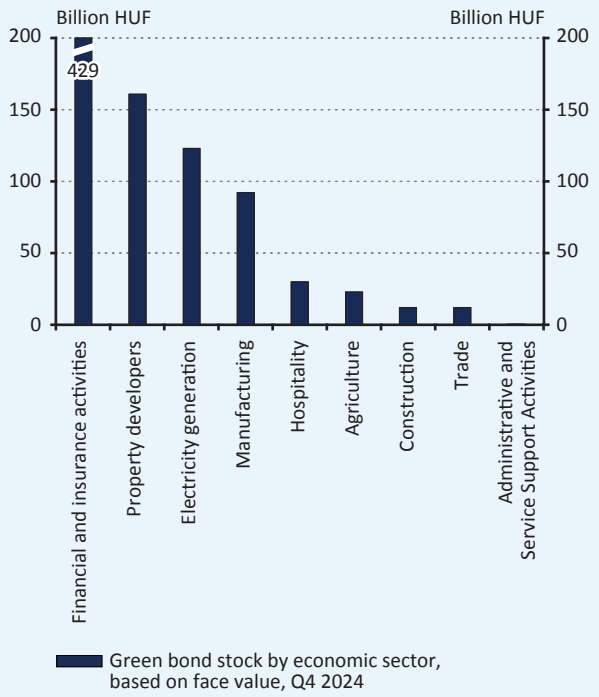
Green bonds were issued even outside the BGS. In 2023, two companies issued green bonds, *Futureal Development Holding Ingatlanforgalmazó Kft.* and *MVM Zrt.* These two companies had already issued bonds in the past, and they both had participated in the BGS as well. While the former had already issued bonds that were green-rated under the programme, the latter had only done so outside the BGS. In 2023, both companies issued foreign currency denominated bonds: the bond issued by *MVM Zrt.* was denominated in USD, while *Futureal Development Holding Ingatlanforgalmazó Kft.* issued a bond in EUR. The number of companies that issued domestic green bonds continued to grow in 2024, one example being *Electron Holding Zrt.* According to the company's statement, the financial proceeds will be used to build and develop solar power plants.

Green bond issuers come from a wide array of economic sectors. A significant portion of the stock of domestic green bonds was issued by companies in the *financial and insurance*; *property; electricity, gas, steam and air conditioning;* and *manufacturing* sectors. Although in a sectoral breakdown, the *financial and insurance sector* stands out with a HUF 429 billion bond portfolio (Chart 3.17), many of these companies are holding companies that are in fact mainly involved in electricity generation and property development.

No universal international standard or definition exists for green bonds. There is a choice of several recognised international standards for the issuance of green bonds. These standards provide clear guidelines for the issuance and reporting requirements, ensuring transparency towards investors, and a truly green use of the financial proceeds. The most popular standard in Europe is the *Green Bond Principles (GBP)*, issued by ICMA *(The International Capital Market Association*) in 2014. Later it has become widely applied in capital markets and largely contributed to the

growth of the green bond market. The *ICMA Green Bond Principles* and other green bond standards and their requirements are highlighted in the MNB's *Green Bond Issuance Guidelines* (2022). [66]

Chart 3.17
Green bonds by sector, at nominal value, in 2024 Q4



Source: MNB

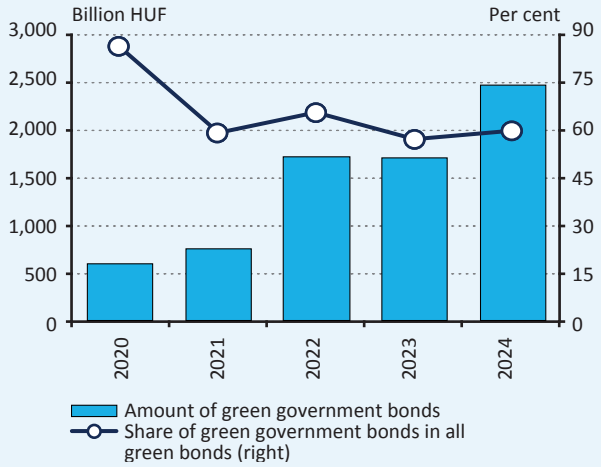
An independent third-party review of the issuers' green framework and the particulars of the issuance may help to build investor confidence. Green bond issuers generally prepare a so-called *Green Bond Framework* prior to the issuance, in which they demonstrate that the proceeds from the issue will be used in accordance with the requirements of the given standard, and in some cases, other international sustainability guidelines. In advance of the issue of the bond, or obtaining the green bond rating, a so-called *Second Party Opinion (SPO)* is commissioned, in which an external party verifies that the framework and the bond are compliant with the *ICMA Green Bond Principles*. Furthermore, the SPO may also assess the issuer's strategies, sustainability objectives, processes or the environmental characteristics and risks of the selected project types. Another type of third-party report is the so-called *Verification*, which confirms whether the bond/framework/issuance is compliant with the given standards and whether the issuer's commitments are being met. An issuance/green bond can be verified in terms of many aspects, but the ICMA suggests one specific type in its manual: a post-issuance verification report, in which the third party confirms that the funds raised by the green bond have indeed been spent by the issuer on the designated/eligible green projects, and that the issuer has ensured the traceability of the funds.

3.2.2 Green Government Securities

The Government Debt Management Agency (ÁKK) issued new green government securities in the value of nearly HUF 700 billion in 2024. The majority of this, EUR 1.5 billion (HUF 580 billion) was raised by issuing 5-year bonds on the international market in early 2024. A 10-year green samurai bond of JPY 1.3 billion (HUF 3 billion) was also issued on the Japanese market in September 2024. In line with previous years, HUF-denominated green government securities were also marketed in regular Hungarian bond auctions during the year. In 2024, the total value of 2032/G bonds increased by HUF 96 billion and the value of 2051/G bonds by HUF 18 billion. As a result of the above, the total value of green government securities amounted to HUF 2500 billion at the end of 2024. The ratio of green government securities remained close to 60 per cent of the total Hungarian green bonds market (Chart 3.18). As a result of the large international issuance volume in 2024, the share of foreign currency bonds in the total volume of green government securities increased to 79 per cent by the end of 2024 (Chart 3.19). In Hungary, at the end of 2024, the ratio of green government securities in the total outstanding amount of government securities was 4.9 per cent. Higher ratios in Europe were shown by Ireland (7.7 per cent), the Netherlands (6.3 per cent) and Denmark (5.7 per cent)[67]. The share of Hungarian green government securities is still below the share of green bonds issued by Hungarian non-financial companies within the total volume of corporate bonds at face value, which is 21 per cent.

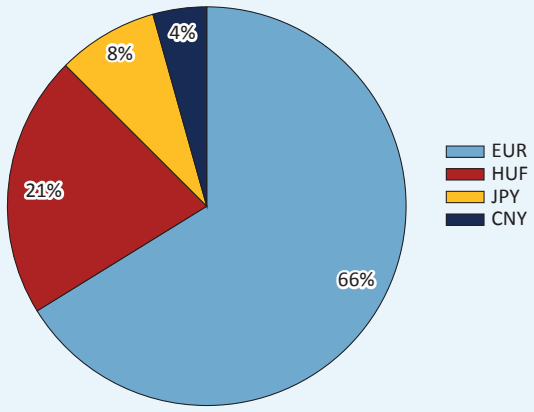
[66] https://www.mnb.hu/letoltes/mnb-zold-kotveny-utmutato.pdf
[67] Based on Bloomberg data, and in terms of the Hungarian ratio, calculated on the basis of Government Debt Management Agency data.

Chart 3.18
Outstanding amount of green government securities and their share in the total volume of green bonds issued by Hungarian institutions



Source: ÁKK, MNB

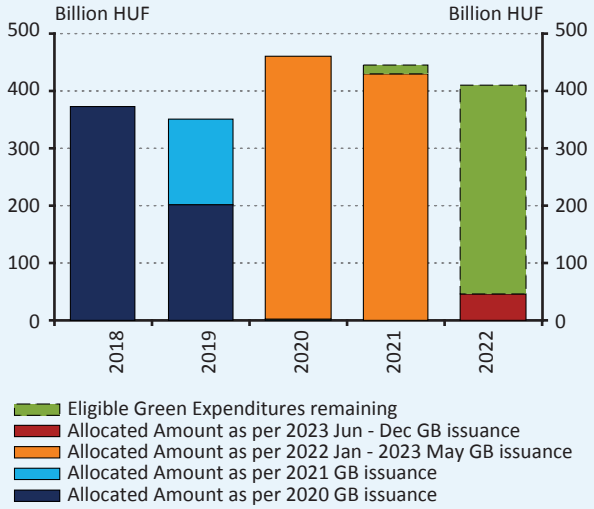
Chart 3.19
Breakdown by currency of green government securities at the end of 2024 (at nominal value)



Source: ÁKK, MNB calculations

The proceeds from the June to December 2023 issuance of green government securities refinanced slightly more than 10 per cent of the 2022 total green expenditures. The Green Bond, renewed in 2023[68], is effective from June 2023, so the latest 2023 Integrated Report[69], published in December 2024, covers the allocation of proceeds of HUF 46.3 billion from bonds issued between the beginning of June and the end of December 2023[70]. This amount was allocated only to a small portion of the 2022 Eligible Green Expenditures. The total amount of Eligible Green Expenditures was HUF 410.4 billion in 2022, of which projects worth HUF 380.5 billion have been selected based on full or partial alignment with the EU Taxonomy Regulation[71]. All the selected projects met the criteria of "substantial contribution" and "minimum safeguards", while only some projects fully met the criterion of "do no significant harm". The HUF 46.3 billion of proceeds from green government securities were proportionally allocated to HUF 380.5 billion worth of selected projects (12.2 per cent allocation), which was 11.3 per cent of the total 2022 Eligible Green Expenditures, amounting to HUF 410.4 billion. The proceeds from the 2024 green government bond issuance will be allocated to the remaining 2022 and subsequent year green expenses (Chart 3.20).

Chart 3.20
Allocation of the proceeds from green government securities issuance to Eligible Green Expenditures, by the year in which they were incurred

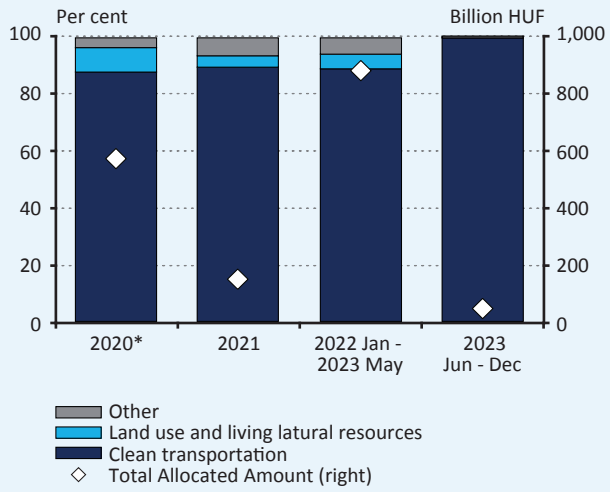


Source: Integrated Report on the Allocation and Environmental Impact of Hungary's Green Bond Proceeds, 2021 (ÁKK); Integrated Report on the Allocation and Environmental Impact of Hungary's Green Bond Proceeds, 2022 (ÁKK); Integrated Report on the Allocation and Environmental Impact of Hungary's Green Bond Proceeds, 2023 (ÁKK); MNB

[68] Green Bond Framework Hungary, July 2023 (ÁKK)
[69] Integrated Report on the Allocation and Environmental Impact of Hungary's Green Bond Proceeds, 2023 (ÁKK)
[70] The 2022 Integrated Report covers the allocation of green government securities issuance in 2022 and January-May 2023.
[71] EU Taxonomy Regulation

99.8 per cent (HUF 46.2 billion) of the proceeds from the June to December 2023 issuances of green government securities were allocated to expenses related to clean transportation (Chart 3.21). According to the 2023 Integrated Report, 95 per cent of the amount allocated to clean transportation (HUF 43.8 billion) was spent on rail transport, mainly on the reimbursement of operating expenses, maintenance and personnel expenses, and in a smaller part on modernisation, electrification of railway lines, and rolling stock development. A further HUF 2.4 billion was allocated to the upgrade of the M3 metro line in Budapest, and on tax exemption for environmentally friendly vehicles. The remaining HUF 62 million of the proceeds were allocated to the green category of "Pollution prevention & control", and HUF 37 million to "Land use & living natural resources".

Chart 3.21
Proceeds from green government securities issuances and their allocationto green sectors, by period of issuance



Source: Green Bond Allocation Report 2020 (ÁKK); Integrated Report on the Allocation and Environmental Impact of Hungary's Green Bond Proceeds, 2021 (ÁKK); Integrated Report on the Allocation and Environmental Impact of Hungary's Green Bond Proceeds, 2022 (ÁKK); Integrated Report on the Allocation and Environmental Impact of Hungary's Green Bond Proceeds, 2023 (ÁKK); MNB

Via the proceeds from the issues of green government securities, 67 kilotonnes of carbon dioxide equivalent greenhouse gas emissions were avoided, which means 1.45 kilotonnes of emissions avoided for every HUF 1 billion raised from green government securities. The results of the projects financed from the proceeds of green government securities issued between June and December 2023 are shown in Table 3.2.

Based on the external review, the selected green expenses and the report were compliant with the 2023 Green Bond Framework. The 2023 external review was prepared by Morningstar Sustainalytics[72]. It was confirmed in the evaluation that the selected projects met the criteria of the Green Bond Framework and that at least one key performance indicator (KPI) was presented for each of the green categories in the 2023 Integrated Report.

Table 3.2
Main environmental impacts of the projects financed from the proceeds of green government securities issued between June and December 2023

Green sector	Indicator	Achieved result
Clean transportation	Avoided emissions	67.139 ktCO2eq
	Renovated railway lines	49.3 km
	Renovated metro line	17.3 km
Land use & living natural resources	Number of projects supported	243
Pollution prevention & control	Number of projects supported	7

Source: Integrated Report on the Allocation and Environmental Impact of Hungary's Green Bond Proceeds, 2023 (ÁKK)

3.2.3 Green Mortgage Bond Issuance

The growth of the green mortgage bond market supports the improvement of energy efficiency on the Hungarian housing market. Mortgage bonds are debt securities issued by specialised credit institutions (mortgage banks), collateralised by mortgage loans. By issuing them, mortgage banks can ensure the long-term refinancing of their lending activities with a stable funding structure, and by aligning the maturities on the asset and liability side of the banks' balance sheets, strengthen the stability of the financial system. Given that mortgage bonds are backed by collateral, they are extremely safe securities, as in the event of default, the assets backing the mortgage bonds can only be used to satisfy the mortgage bond holders, giving them absolute priority over the mortgage bank's creditors. In addition

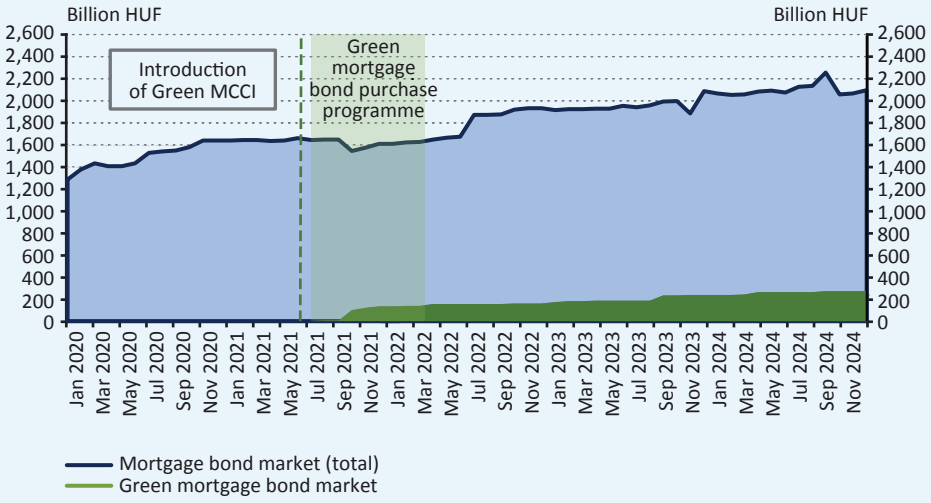
[72] Morningstar Sustainalytics: Government of Hungary Annual Review (2024)

to the above, green mortgage bonds are also important from an environmental point of view, as mortgage banks use the proceeds to finance or refinance green mortgage loans, for the construction, purchase or renovation of modern, energy-efficient properties (green properties). By using the financed or refinanced green mortgage loans as collateral, the investor protection requirements and also the social and economic policy requirements related to environmental sustainability are met. Green mortgage bonds can also help to stimulate more activity in the loan market. When investor demand for green mortgage bonds increases, this could encourage banks to give preference to green mortgage loans, which could lead to lower lending rates, through lower credit risk[73], better pricing of the funds raised, and potentially to an increase in the demand for mortgage loans.

The MNB supported the creation of a domestic green mortgage bond market with targeted monetary policy tools. The MNB launched a Green Mortgage Bond Purchase Programme in August 2021, with the aim of promoting the development of a green mortgage bond market in Hungary and supporting the spread of mortgage lending practices that focus on energy efficiency. The MNB has developed the programme as part of its green toolkit strategy, which was announced after the 6 July 2021 decision of the Monetary Council. The strategy paper published by the MNB details how environmental sustainability can be integrated into the MNB's monetary policy toolkit. Further, the MNB's macroprudential toolkit uses the Mortgage Funding Adequacy Ratio as a supply-side incentive (JMM), which has given green mortgage bonds and refinancing loans a preferential weighting from 1 July 2021, thereby encouraging mortgage banks to issue green mortgage bonds.

The share of green mortgage bonds continued to grow in the Hungarian market in 2024. Following the launch of the Green Mortgage Bond Purchase Programme by the MNB, the market share of green mortgage bonds started to steadily increase. At the end of the programme in April 2022, the green share was 9.4 per cent (HUF 156.1 billion) of the total mortgage bond market. The idea of creating a green mortgage bond market was successful, which is illustrated by the fact that the size of the market continues to grow, amounting to 11.3 per cent of the total market (HUF 237.8 billion) at the end of 2023, and 12.9 per cent of the total market (HUF 272.2 billion) at the end of 2024 (Chart 3.22). In terms of ownership structure, the vast majority of the mortgage bonds are held by domestic institutions. The ratio of foreign ownership remained unchanged in 2024, standing at 7.5 per cent at the end of the year, compared with 7.4 per cent at the end of 2023.

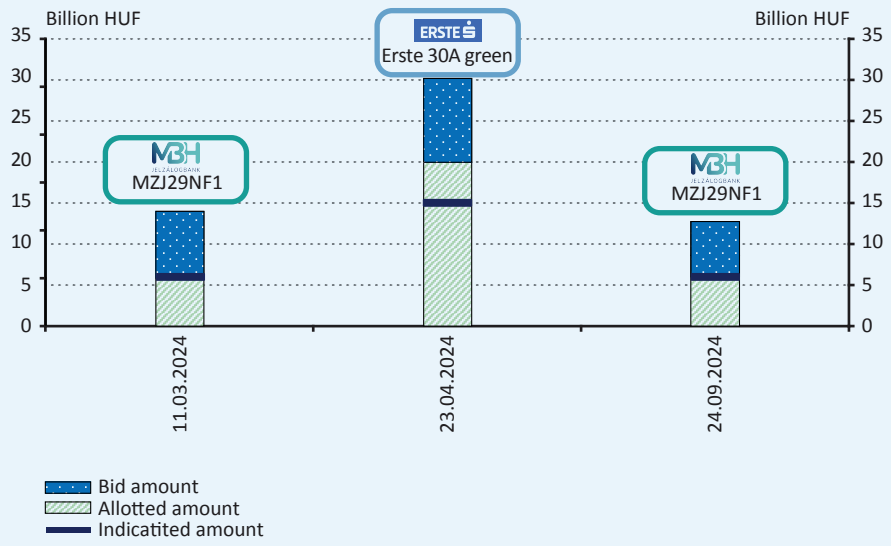
Chart 3.22
The Hungarian mortgage bond market (at nominal value)



Source: MNB

[73] Billio et al. (2021): Buildings' Energy Efficiency and the Probability of mortgage Default: The Dutch Case

Chart 3.23
Green mortgage bond issuance in 2024



Source: Budapest Stock Exchange

Three successful green mortgage bond issuances were completed in 2024 (Chart 3.23). Two domestic mortgage banks raised more than HUF 34 billion in nominal value in the green bond auctions. MBH Mortgage Bank issued two green mortgage bonds, the first in March 2024, with a nominal value of HUF 5.9 billion, with a 5-year maturity and a yield of 7.20 per cent. Later, in September 2024, it placed the second tranche of the same mortgage bond and accepted bids of HUF 8.6 billion at an average yield of 6.71 per cent. The largest green mortgage bond issue of the year was conducted by Erste Mortgage Bank, with the auction of the second tranche of the Erste 30A green mortgage bond series, accepting bids at a nominal value of HUF 19.95 billion. The bank raised funds for a 5-year maturity at an average yield of 8.06 per cent under the auction.

The positive environmental impacts of green mortgage loans are disclosed by the mortgage banks by publishing their impact reports and transparency reports. The positive environmental impacts are disclosed by presenting the avoided energy use and avoided greenhouse gas (GHG) emissions, in line with international best practices. The calculation is based on the energy demand of the properties the mortgage banks finance, which is shown in the energy performance certificates of the given properties or can be estimated based on the available data. The aggregate energy demand of the financed green property portfolio calculated in this way is then compared to the benchmark used by the mortgage bank (which can be the estimated average energy demand of the total loan portfolio refinanced by the mortgage bank, or the estimated average energy demand of the total Hungarian housing market) to get the amount of total energy use avoided by the financed green properties. Two methodologies are used to calculate the avoided GHG emissions in Hungary. One methodology is that the mortgage banks calculate the avoided GHG emissions using an emission factor, which gives the carbon dioxide equivalent emissions per unit of energy use, and thus the avoided GHG emissions can be calculated as the avoided energy use multiplied by the emission factor. Under the second methodology, an individual GHG emission value is assigned to each property in the mortgage bank's portfolio, and the avoided GHG emissions value is determined as the difference between the aggregated, pro-rated GHG emission values of the green and non-green properties in the portfolio[74].

As the transparency reports show, the positive environmental impact of the green mortgage bonds is the avoidance of around 20,400 tonnes of carbon dioxide emissions per year. At the time of our report, mortgage banks had not yet published their full impact reports for 2024, so the positive environmental impact of the green mortgage bond market was determined based

[74] The calculation is based on the Partnership for Carbon Accounting Financials (PCAF) methodology and accounting.

on data from the quarterly transparency reports. After around 21,900 tonnes of GHG emissions were avoided in 2023, it is estimated that in 2024 the green mortgages financed or refinanced through green mortgage loans contributed to avoiding a total of around 20,400 tonnes of GHG emissions[75]. The slight reduction in the positive environmental impact is mainly due to the fact that in 2024, some mortgage banks have lowered the benchmarks they use, i.e. they have set a portfolio with better energy-efficiency as the benchmark. The around 20,400 tonnes of carbon dioxide emissions avoided, as stated above, is calculated as the sum of the emission avoidance HUF 1 billion per bank, reported in the transparency reports of the individual mortgage banks, and the proportionate value of the green mortgage bond portfolio, at nominal value.

3.2.4 Investment Funds

The share of green investment funds in the total Hungarian market remains low. Although the EU SFDR regulation[76] aims to helps investors to better understand investment funds that promote environmental and/or social factors and have a sustainable investment objective, their popularity was not increased excessively. Investment funds, insurance funds and pension funds can be divided into three categories, depending on their environmental commitment:

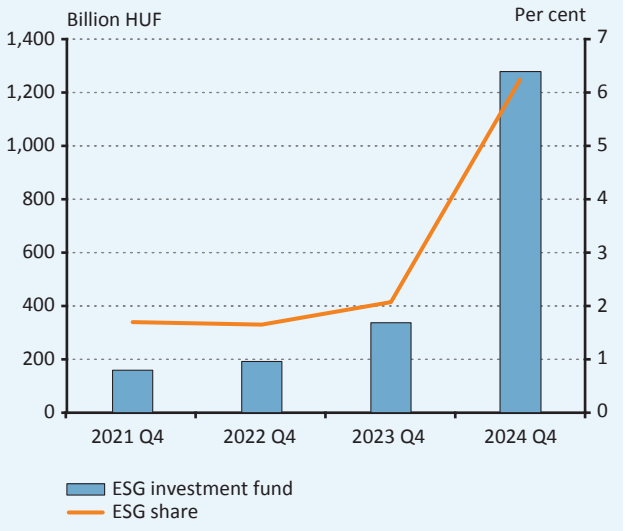
I. traditional investment funds that do not have a sustainable investment objective or do not promote environmental and/or social characteristics – SFDR Article 6 funds

II. ESG investment funds that aim to promote environmental and/or social characteristics ("light green") – SFDR Article 8 funds

III. sustainable investment funds that contribute to a social or environmental objective ("dark green") – SFDR Article 9 funds.

The net asset value of domestic ESG and sustainable investment funds increased to HUF 1,276 billion in 2024 (Chart 3.24). However, a significant part of the dynamic growth was due to the reclassification of a single fund, i.e. there was no significant overall market change, as the number of ESG funds increased by only one fund. Nonetheless, the market share of ESG funds reached 6.2 per cent in Q4 2024, which is 4.1 percentage points higher than in Q4 2023. The only domestic sustainable investment fund did not grow in terms of its net asset value share in 2024.

Chart 3.24
Growth of domestic ESG and sustainable investment funds by net asset value and their share change in the total portfolio



Source: MNB

Although the Hungarian market is showing stagnation, ESG investment funds are growing again in the EU. The Q4 2024 report by Morningstar[77] shows that ESG and sustainable funds together reached EUR 6.1 trillion in assets, covering 60 per cent of the total market. This was mainly driven by Article 8 funds, which saw net inflows of EUR 52 billion in the last quarter of 2024. At the same time, the share of "dark green" funds in the EU has declined for the 5th consecutive quarter, with outflows of EUR 7.3 billion in Q4 2024. In terms of the total number of ESG funds in the EU, it is positive that 802 new "dark green" and "light green" funds were launched in 2024, while 521 funds closed, a significant increase in the balance of change compared to the previous year.

3.2.5 Unit-linked Insurance Asset Funds and Voluntary Pension Fund Portfolios

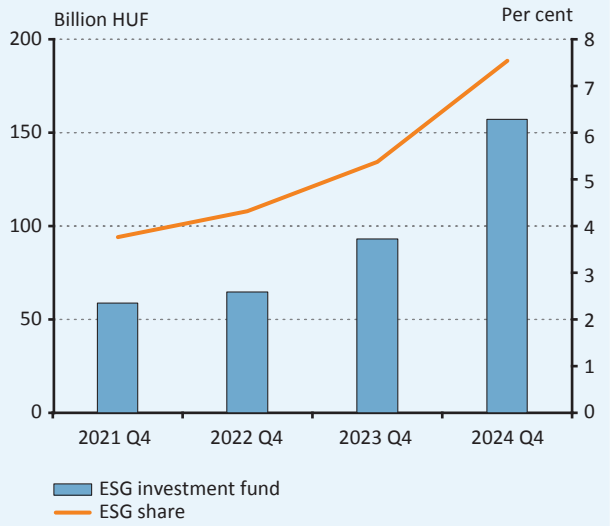
There is a gradual but slow increase in the net asset value of unit-linked funds focusing on green aspects. Growth can be experience not only in asset value, but the market share of ESG and sustainable unit-linked funds is

[75] Based on the mortgage bank transparency reports.
[76] Regulation (EU) 2019/2088 of the European Parliament and of the Council
[77] SFDR Article 8 and Article 9 Funds: Q4 2024 in Review, Morningstar

also steadily increasing. By the end of 2024, their net asset value amounted to nearly HUF 158 billion, while their ratio was 7.6 per cent, 2.2 percentage points higher than in Q3 2023 (Chart 3.25). Similarly to the investment funds, the share of "light green" funds is dominating, while the share of "dark green" funds remains low, even though there are 5 "dark green" funds on the market (or 8, including all the series). However, it must be highlighted that 3 of these (or 5, including all series) SFDR Article 9 funds were launched in 2024. Overall, the net asset value has grown by just over 68 per cent, well above the 20 per cent increase measured for all unit-linked funds.

Compared to asset funds, voluntary pension fund portfolios are lagging far behind asset funds. There has been no change in recent years, with only one voluntary pension fund offering a single ESG fund portfolio with a net asset value of nearly HUF 10.9 billion and a market share of less than 0.5 per cent. In addition, there are no sustainable, i.e. SFDR Article 9 funds compliant portfolios.

Chart 3.25
Growth of domestic ESG and sustainable asset funds by net asset value and change in their share in the total portfolio



Source: MNB

Box 6
A new milestone, supporting the domestic implementation of the SFDR

The MNB continues to enlarge the list of documents facilitating the domestic implementation of the SFDR. In the management circular issued on 17 March 2021, the MNB supported financial market participants subject to the SFDR as a first step by setting out its supervisory position and expectations regarding the application of the main provisions of the SFDR[78] applicable from 10 March 2021. In the management circular, MNB indicated to issue further regulatory tools if needed (e.g. a Q&A) later on, after the SFDR RTS[79] is published. The MNB's primary objective in issuing the Q&A was to support the Hungarian market participants in implementing the SFDR and the related legislation, and to facilitate the development of new financial products compliant with Articles 8 and 9 of the SFDR, thereby "greening the capital market". The MNB published its first "Q&A on the application of the SFDR and the Taxonomy Regulation on sustainability disclosures" (hereinafter referred to as the "Q&A") on 29 June 2022.

Since 2022, new legislation and the large number of questions received from the market participants have led to the publication of a new Q&A (hereafter referred to as the "updated Q&A"). The updated Q&A, published in 2025, serves as an update to the previously published Q&A, providing answers to new questions raised by market participants since 2022. In the previous Q&A, most of the questions were related to investment fund managers, while the updated Q&A is also addressed to insurance companies offering insurance-based investment products, pension funds issuing pension products, AIFMs and UCITS fund managers.

[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

[79] Commission Delegated Regulation (EU) 2022/1288 of 6 April 2022, to supplement Regulation (EU) 2019/2088 of the European Parliament and of the Council with regard to the content and presentation of information on the principle of significant damage prevention, and the content, methodology and presentation of information on the sustainability indicators and adverse sustainability impacts, and supplementing the regulatory technical standards specifying the content and presentation of information in the pre-contractual documents, on websites and in periodic reports, relating to the promotion of environmental and social parameters and sustainable investment objectives.

The updated Q&A now includes the supervisory position and expectations on naming the funds (by all institutions), referring to the ESMA[80] and EIOPA[81] guidelines on this subject. Among the general questions, several questions continue to address the sustainability disclosures for all financial products covered by the SFDR (i.e. not only financial products that promote environmental and/or social characteristics or that have a sustainable investment objective). The updated Q&A has a separate chapter on the supervisory authority's views on possible ways to integrate sustainability risks into the risk management framework of investment fund managers and insurers, including the MNB's requirements on the roles/responsibilities of those participating in the risk management processes of the investment fund managers and insurers.

In the document, which answers nearly 50 questions, the MNB has identified good and bad practices on a number of topics, to help the market participants. In view of the consolidated Q&A[82], which is continuously updated by the ESAs and the expected revision of the SFDR RTS, the updated Q&A will be reviewed regularly. The MNB may refer to the Q&A and may monitor compliance with it during the licensing and audit procedures of financial market participants who are subject to the SFDR and are under its supervision.

[80] Guidelines on funds' names using ESG or sustainability-related terms
[81] The EIOPA published its opinion on greenwashing and sustainability claims (Opinion on sustainability claims and greenwashing) on 31 May 2024.
[82] Consolidated questions and answers

4 Local and International Legislation and Expected Changes

Legislative and regulatory changes related to green finance continued last year, reflecting the evolving framework of sustainability governance. The regulatory system aims to ensure that the business community also contributes to the climate goals and sustainability targets. The European Union introduced several new measures aligned with the European Green Deal, including the CSRD, which mandates enhanced sustainability disclosures by companies, and the EU Taxonomy Regulation, designed to classify economic activities based on their environmental sustainability. Furthermore, the Emissions Trading System (ETS) is undergoing reform to strengthen carbon emission reductions. While these regulatory efforts reflect the EU's commitment to environmental and social sustainability, certain deregulatory tendencies have also emerged in 2025.

Regulatory instruments are also central to MNB's approach to facilitate the green transition. In alignment with European developments, the MNB has introduced its own regulatory initiatives. Notably, the MNB's ESG Recommendation, which enters into force in phases from 1 January 2025, aims to enhance the identification and quantification of sustainability-related risks in the lending process.

4.1 RECENT DEVELOPMENTS RELATED TO INTERNATIONAL ORGANISATIONS

The European Central Bank (ECB) continues to pave the way among the world's central banks, with its climate change strategy. The ECB published its second report on the carbon footprint and climate risk exposure of its financial portfolios last year. According to the report, the carbon emissions of the Eurosystem's corporate sector-related portfolios continued to decline, as the issuers of new securities are becoming greener, and as the Eurosystem's investment strategy favours companies with better environmental performance.[83]

The ECB made considerable efforts to assess the impact of the different climate scenarios on the financial system. As part of this, the ECB and the European supervisory authorities (EBA, EIOPA, and ESMA) jointly published the results of the one-off "*Fit-For-55"* climate scenario analysis. The scenarios examined suggest that the transition risks alone do not pose a threat to the financial stability of the EU, but if these risks are coupled with macroeconomic shocks, financial institutions could face significant losses. For this reason, according to the ECB, a coordinated policy approach is needed to finance the green transition and the financial institutions need to integrate climate-related risks into their risk management in a comprehensive and timely manner.[84]

Furthermore, within the ECB, significant intellectual effort is being devoted to expanding the knowledge base that supports climate protection. Among their 2024 publications, a particularly notable study examines the impact of the ECB's supervisory authority activities on the climate risk management of banks.[85]

The Network for Greening the Financial System (NGFS) continued to actively facilitate a green way of thinking in 2024. The global importance of the NGFS is demonstrated by the fact that the number of network members has grown from 90 to 142 countries by December 2024[86], with a further 21 organisations participating as observers.[87] The

[83] Eurosystem and ECB portfolios steadily decarbonising, climate-related disclosures show
[84] Transition risk losses alone unlikely to threaten EU financial stability, "Fit-For-55" climate stress test shows
[85] The Impact of ECB Banking Supervision on Climate Risk and Sustainable Finance
[86] The Federal Reserve Board announced its intention to exit from the NGFS, on 17 January 2025.
[87] Membership | Network for Greening the Financial System

MNB was the first Central European participant to join the NGFS in January 2019.

The NGFS focuses on increasing the knowledge base on sustainability, climate change and the transition towards a low-carbon economy. The NGFS has published various papers on topics such as climate scenarios that provide relevant information for central banks and supervisory authorities, the macroeconomic and monetary policy implications of climate change, and the macroeconomic models of climate change.[88] The long-term climate scenario published in November 2024 presents quite a negative picture of potential GDP losses arising from climate change. According to the document titled "NGFS Climate Scenarios for central banks and supervisors – Phase V", under the current policies, up to 30 per cent of the global GDP could be lost due to climate change by 2100, which is twice the previous estimates.[89]

The Financial Stability Board (FSB) has focused on identifying and addressing the financial risks posed by climate change for many years. The FSB published its latest status report on the international and national measures aimed at ensuring the consistency and comparability of the financial disclosures in 2024. The report shows that almost three-quarters of the FSB member jurisdictions, standard-setters, and international organisations have already introduced voluntary or mandatory financial disclosure requirements, based on the International Sustainability Standards Board (ISSB) standards and the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).[90] According to the IFRS Foundation , the proportion of companies that disclose information in line with the TCFD recommendations is steadily increasing, but still only a few companies publish climate-relevant information on their governance, strategy and objectives.[91]

The International Monetary Fund (IMF) also continued its activities to support the global fight against climate change last year. The framework outlining the details of climate protection-related cooperation between the IMF and the World Bank was published in 2024. The key objective of the cooperation between the two institutions is to provide critical support to countries in developing their climate strategies through an integrated, country-led approach. As part of this, the IMF and the World Bank offer technical assistance in various policy areas, and work with other multilateral development banks and development partners to support the implementation of climate-related reforms, by providing technical assistance and the necessary financing.[92]

The IMF also plays a key role in increasing climate-related knowledge. The IMF, together with four other international institutions (WTO, OECD, UN, World Bank), published a landmark report last year, calling for the need to step up climate actions to meet the global emission reduction targets. The report highlights the central role of carbon pricing in reducing emissions through cost-effectiveness and the cross-border effects of national climate policies.[93]

The Organisation for Economic Co-operation and Development (OECD) issued several publications in 2024. The working papers cover the areas of climate adaptation, green industrial policies and net zero emissions.[94] The OECD also published "The Climate Action Monitor 2024" report in 2024.[95] The paper argues that there is a significant gap between the global climate policy and the national emission reduction targets. Until August 2024, 110 countries had committed to reaching net-zero emissions by 2050 and beyond, covering around 88 per cent of the global GHG emissions. However, only 27 countries and the EU – which accounts for 16 per cent of global GHG emissions – have enacted these targets in their legislation.[96]

The United Nations Environment Programme Finance Initiative (UNEP FI) also introduced several new initiatives last year. These are designed to support the insurance sector's green transition, while increasing its resilience to climate change. In May 2024, UNEP FI established the PSI Nature-Positive Insurance Working Group to advance the integration of natural capital into the insurance value chain through knowledge sharing and capacity building. Further, the UNEF FI also prepared a guideline titled Forum for Insurance Transition to Net Zero (FIT), to support the insurance sector in its green transition. It has also published

[88] NGFS publications | Network for Greening the Financial System
[89] NGFS scenarios for Central Banks and Supervisors – Phase 5 – Green Central Banking
[90] Achieving Consistent and Comparable Climate-related Disclosures: 2024 Progress report
[91] Progress on Corporate Climate-related Disclosures – 2024 Report
[92] World Bank Group and IMF Deepen Joint Effort to Scale Up Climate Action
[93] Joint Report Explores Scope for Coordinated Approaches on Climate Action, Carbon Pricing, and Policy Spillovers
[94] Climate change | OECD
[95] The Climate Action Monitor 2024 | OECD
[96] Progress in national climate policy efforts remains insufficient to achieve 2030 targets | OECD

documents that contribute to the integration of biodiversity considerations into the decision-making processes (Principles for Responsible Banking Sector Action Guidance for Nature; Nature in the Boardroom; From Kunming-Montreal to Cali; Finance for Nature Positive Discussion Paper).

The UNEP FI has also taken specific steps to support the transition to a circular economy and reducing air pollution. In November 2024, 180 institutions – representing a combined wealth of USD 17.2 billion – called on governments to negotiate a treaty to end plastic pollution. *The Finance Statement on Plastic Pollution*, published by the UNEP FI, in collaboration with several partners, calls for the introduction of binding rules for the whole life cycle of plastics. It also stresses the link between plastic pollution and climate change, biodiversity loss and pollution, and highlights the need for system-level solutions.

Box 7
Sustainability measures taken by Banco Central do Brasil (BCB)[99]

The central bank of Brazil, Banco Central do Brasil (BCB), has been promoting sustainability for many years. Thanks to a number of environmental and green measures, it regularly ranks highly in Positive Money's annual Green Central Banking Scorecard, which is based on the green measures and initiatives of G20 central banks. In 2024, for example, it was ranked 5th, the highest of all non-European countries.[98] The BCB's activities are wide-ranging: in recent years, it has taken measures in areas such as macro- and microprudential regulation; raising green awareness through conferences and studies and research; developing disclosure rules on environmental risks; encouraging innovative solutions in green areas through international competitions; and organisational changes to promote sustainability.

The BCB established the framework called "Social and Environmental Responsibility Policy" (PRSA) in 2017, which was renamed "Social, Environmental and Climate Responsibility Policy" (PRSAC-BCB) in 2024. The updated framework aims to contribute to Brazil's sustainable development goals along the social, environmental and economic factors; develop recommendations and guidelines to enhance environmental protection and climate resilience; and encourage a sustainability-focused approach within its organisation. The PRSAC-BCB is such an integral part of the daily life of the BCB that all BCB vice-governors and their respective fields must take the framework into account in their own work and take decisions and measures that are consistent with the PRSAC-BCB. The BCB was also involved in the creation of the national taxonomy system in 2023 and is a board member of the Interinstitutional Committee for the Brazilian Sustainable Taxonomy (CITSB), which was established in 2024 as the governing body of this taxonomy.[99]

For years, the BCB has been sharing its infrastructure, i.e. its available buildings with other public authorities and public bodies, in support of sustainability and cost-efficiency. Depending on the location, tenants occupy between 10 and 40 per cent of the buildings and pay no rent, only operating expenses. In 2023, this practice resulted in a saving of USD 3.2 million (BRL 18.6 million). Further, the BCB is also an active player in the international scene for sustainable development, working closely with organisations such as the NGFS, of which it has been a member since March 2020, and the Financial Stability Board. Since 2018, the BCB and other Brazilian institutions have been working with the German government under the framework of the Brazilian Sustainable Finance initiative, which aims to develop the Brazilian green finance market. In 2024, the BCB, together with the Innovation Hub operated by the Bank for International Settlements, also organised an international competition – the G20 TechSprint – to identify innovative technologies and solutions for sustainable development.

[97] Sustainability
[98] Green Central Banking Scorecard – Green Central Banking
[99] Report on Social, Environmental and Climate-related Risks and Opportunities

Table 4.1
Examples of the main measures taken by central banks in 2024 in relation to sustainability, based on specific criteria 100

Central bank	Macro and micro prudential system	Sustainability components in the central bank's portfolio	Conference	Stress test101	Publication	Establishing an organisational unit / working group	Disclosure/ TCFD	ESG
Austria			*Climate Change Conference*	*Yes*	*Climate exposure of the Austrian banking system*		*TCFD Report*	
Belgium	*Recommendation on energy efficiency*	*Sustainable Investment Charter*	*Climate Change Conference*	*Yes*	*Productivity in the context of climate change*	*Climate risk hub*	*TCFD Report*	*ESG considerations in the portfolio*
Brazil	*Environmental and Climate Policy Framework (PRSAC)*	*Sustainability considerations in the portfolio*	*Climate Policies Seminar*	*Yes*	*Climate Risk Report*	*Organisational unit within the central bank*	*Consultation on the amendments to the disclosures*	*Disclosure and publication*
China	*Prolongation of the refinancing programme (CERF)*	*Green Bond Project Catalogue*		*Yes*	*Thoughts on green finance*	*Joint Green Finance Task Force with Singapore*	*Climate risk disclosure*	*ESG Recommendation (CBIRC)*
Croatia	*Climate Strategy*		*Climate risk management workshop*		*Effects of extreme weather on the Croatian economy*			*Joining the NGFS*
Denmark	*Climate exposure management in the banking sector*	*Disclosure of the carbon footprint of FX reserves*	*Climate Conference*		*New methodology for assessing the risks of the green transition*			
ECB	*The impact of banking supervision on climate risk management*	*Portfolio-related disclosure*	*Climate Conference*	*Yes*	*Climate strategy*	*ECB Climate Change Centre*		
Central bank	*Macro and micro prudential system*	*Sustainability components in the central bank's portfolio*	*Conference*	*Stress test*	*Publication*	*Establishing an organisational unit / working group*	*Disclosure/ TCFD*	*ESG*
England	*Managing climate risks*	*Greening corporate bond purchases*	*Climate Change Conference*	*Yes*	*Annual Report*		*TCFD Report*	

[100] The list is not exhaustive; we have listed only a few key measures. The new measures compared to last year's Green Finance Report are indicated in italics.
[101] Stress tests already announced are also listed.

Table 4.1
Examples of the main measures taken by central banks in 2024 in relation to sustainability, based on specific criteria 100

Estonia		Climate-related financial disclosures			The impact of climate policies on productivity			
France	Assessment of risks to the French financial system	Responsible Investment Report	Climate Conference		Nature-economy models	Climate Change Centre	Joining the CDP	
Greece			Presentation of the National Climate Plan		Climate-related work at the BoG	Centre for Sustainability		
Hungary	Green preferential capital requirement programme	Sustainable and Responsible Investment Charter	Green Finance Conference	Yes	Green Finance Report	Sustainable Finance Directorate	TCFD Report	ESG Recommendation
Ireland	Consultation	BIS Green Bond Investment Fund	Climate Risk Forum		Climate Observatory	Organisational unit	TCFD Report	Circular
Italy	Supervisory requirements on climate risks	Responsible Investment Charter	Climate change and transition workshop	Yes	Compilation of green studies	Climate Change Hub and Climate Change Committee	TCFD Report	Guide for SMEs
Japan	Regulatory framework for climate finance	Programme supporting green investments		Yes	Climate scenario analysis	Climate Change Coordination Hub	TCFD Report	Questionnaire
Korea		Negative screening system	MNB-BoK joint workshop	Yes	Impacts of climate change on the Korean economy	Sustainable Growth Office		ESG focus in the portfolio
Latvia	Roadmap for a sustainable financial sector	Sustainability strategy		Yes	Financial Stability Report		TCFD Report	
Lithuania	Green Strategy for 2023-2025	Responsible investment principles	Vienna Initiative Full Forum 2024		Carbon Footprint Report	Climate Change Centre	TCFD report	
Luxemburg		Sustainable corporate strategy				Green comitology	TCFD Report	
Central bank	Macro and micro prudential system	Sustainability components in the central bank's portfolio	Conference	Stress test	Publication	Establishing an organisational unit / working group	Disclosure/ TCFD	ESG

Table 4.1
Examples of the main measures taken by central banks in 2024 in relation to sustainability, based on specific criteria 100

Malaysia	Climate data catalogue	Portfolio guarantee	Climate Change Conference	Yes	BNM-World Bank joint report	Climate Financing Innovation Hub	TCFD application guide	Information website
Mexico	Green standards and metrics		Biodiversity Conference	Yes	Climate risks and opportunities	Organisational unit within the central bank	TCFD Consortium	
Netherlands	Guide to managing climate risks	Sustainability goals in portfolio management			Analysis of financial institution's climate action plans	Sustainable Finance Office	Harmonisation of disclosure	
Portugal	Decarbonisation Programme	Participation in the BIS Green Bond Investment Fund	Climate Risk Workshop	Yes	Climate exposure of the banking sector	Committee within the central bank	TCFD Report	ESG Report
Russia	Recommendations on climate transition	Climate Strategy	COP29 workshop	Yes	Climate policies and trade restrictions	Sustainability working group		ESG Recommendation
Singapore	Multi-sector Taxonomy System and Net Zero Action Plan	Green Investment Programme	MAS-World Bank and FAST Conference	Yes	Sustainability Report	TRACTION	Climate reporting	"Gprnt" digital platform
Spain	Supervisory requirements	Climate considerations in the portfolio	Sovereign Green Bonds Workshop	Yes	Compilation of green studies	Working Group	TCFD Report	ESG risks .
Sweden		Carbon footprint consideration	Climate Change Conference	Yes	Impact assessment of payment services	Sustainability Committee	Climate Report	
United Arab Emirates	Principles for sustainability-related disclosure	Sustainability aspects in the portfolio	Climate Conference under the auspices of the COP28	Yes	Innovative technologies in sustainable finance	Sustainable Finance Working Group		ESG supervision
United States	Managing climate risks		Climate Conference	Yes	The impact of competition on climate change adaptation in the banking sector	Committee on Climate Risk		Risk management proposal

Source: edited by the MNB, based on information provided by central banks and international organisations

Box 8
WWF SUSREG report

The World Wide Fund for Nature (WWF) is the largest conservation NGO, which is actively involved in the protection of our natural values, also in Hungary. However, it is less well known that since 2021, the WWF has been assessing the activities of the world's central banks and financial supervisory authorities from a sustainability perspective in an annual report. The report shows the extent to which environmental, climate and social considerations have been integrated into the financial regulation, supervisory expectations and monetary policy.

Each year the report is extended to more countries and more detailed indicators, with 52 countries already covered for 2024. Some new features of the latest report include the inclusion of marine habitat considerations in the financial supervision practices, an examination of how the supervisors monitor compliance with their expectations, and whether they disclose their actions against financial institutions that do not comply with their requirements. In addition to the quantitative results and the good practices presented, the report offers important lessons and recommendations for financial supervisors and central banks worldwide. These include the introduction of the double materiality principle in the financial supervisory authority activities (i.e. the impact of the supervised institutions on the environment, and the impact of the environment on the supervised institutions should be simultaneously analysed), and the development of a methodology for measuring the nature-related risks, and their integration into the financial regulation. The report also proposes that the setting of climate and biodiversity targets and the development of transition plans be made mandatory for financial institutions. The report emphasises that many countries still lack strong policies to address nature-related risks, such as measures to reduce deforestation or halt biodiversity loss (the importance of which is underlined by the European Banking Authority in its final report on the guidance on managing environmental, social and governance (ESG) risk).

The MNB's sustainability-related work has been recognised by the NGO for several years, with high rankings and scores, and repeated references to the MNB's good practices in its publication. It is worth noting that the latest report ranks the MNB's insurance supervision activity as the second best in the world (after the Singapore Financial Supervisory Authority) in terms of the environmental indicators assessed, confirming that the MNB is among the most effective financial supervisory and regulatory institutions in responding to environmental and climate change risks. The MNB also scored highly in the field of banking supervision activity and central bank activity. The best practices presented in WWF's last year report included the MNB's Green Preferential Capital Requirement Programme, the MNB's green central banking measures and the joint MNB-OECD-EU Biodiversity Project.

4.2 NGFS RECOMMENDATIONS AND THE RELATED MNB MEASURES

The MNB's measures are in line with the recommendations of the NGFS, which is one of the most important international organisations supporting the greening of central banks. In terms of the green financial regulatory system, the NGFS recommendations and proposals for action[102] (already presented in Chapter 4.1) developed to make the financial system greener can be considered international best practice. When introducing its measures (Table 4.2), the MNB has tailored its programmes with these in mind.

In September 2024, the MNB issued its ESG Recommendation 9/2024 for credit institutions and financial enterprises. By using its own questionnaire to assess the environmental, social and governance information, the MNB aims to increase the predictability and consistency of the application of the legislation. For more information on the Recommendation, see Chapter 4.3.

[102] NGFS (2019): A call for action Climate change as a source of financial risk

Table 4.2
NGFS recommendations and MNB measures

#	Proposal	MNB measures
1	Integration of climate-related risks into the macro- and micro-prudential supervisory authority practices	Conducting long-term and short-term climate stress tests in the Hungarian banking sector
		Conducting climate risk stress tests and climate risk preparedness analysis of the insurers' assets
		Issued the MNB Green Recommendation for Credit Institutions, with specific deadlines for meeting the supervisory authority requirements
		Issued the Green Recommendation for Insurers
		Conducted an analysis covering the entire Hungarian banking sector in relation to compliance with the MNB's Green Recommendation
		Issued the ESC Recommendation for Credit Institutions and Financial Enterprises
		MNB and OECD project to assess the financial risks from biodiversity loss
		The Green Preferential Capital Requirements Programme has been renewed and expanded, the Certified Consumer-friendly Housing Loan products offered for green purposes have been integrated, and a background study for risk assessment has been published
2	Integration of the sustainability aspects into the central banks' portfolio management activities	Created a dedicated green portfolio
3	Finding a solution for data deficiencies	A requirement is set to report green data under the Green Preferential Capital Requirement Programme
		The green data disclosure requirement has been extended
4	Raising awareness and expanding the relevant knowledge base, providing technical assistance, encouraging knowledge sharing	Launched the green financial product finder to inform investors
		Published the methodology for long-term and short-term climate stress tests
		Signed the UN Guiding Principles for Responsible Banking as a supporter
		Continues the university education and research programs, banking and capital market training courses
		Green financial reports, articles and studies are getting published
		International green conferences are organised
		MNB Technical Assistance Programme for green finance is organised
		The Green Recommendation issued for credit institutions includes a compilation of data and methodological resources
5	Establishing well-founded and internationally consistent disclosure procedures on climate change and environmental risks	Published a climate change-related financial report (TCFD report)
		Issued a Green Recommendation for credit institutions, with a separate chapter on disclosure requirements
		Supports the implementation of the disclosure obligations under the SFDR with a management circular and Q&A
6	Supporting the development of a taxonomy system	Ensures the simplified application of the EU green taxonomy under the Green Preferential Capital Requirement Programme

Note: The measures in italics are new compared to the previous year's report.

The MNB's green data disclosure activities have been significantly expanded in 2024. In addition to the disclosure of data on its green financial portfolio, the MNB now also discloses climate change-related risks. The green financial portfolio-related data disclosure contains information on the development of the green money, insurance, investment fund and capital markets, and the energy rating of the residential properties offered as collateral. The disclosure aims to provide proper information to the market participants, academics and the wider public.

The biodiversity-focused, nearly 2-year research and methodology project conducted by the MNB and the OECD was finished in 2024. The project included the preparation of a methodological monitoring framework and its Hungarian implementation. The framework also

covers supervisory authority recommendations to mitigate the related risks. For more information on this project, see Chapter 2.4.

The MNB started the greening of the Certified Consumer-friendly Housing Loan (CCHL) framework in 2024. From April 2025, an interest rate reduction of at least 0.5 percentage points is offered to borrowers if the green loan purpose is fulfilled. The changes aim to encourage the development of products that support green housing goals, on favourable terms, accessible to a wide range of customers, thus supporting the energy-related renewal of the domestic housing loan market. For more information on the changes to the CCHL program, see Chapter 3.1.

4.3 THE MNB'S ESG RECOMMENDATION

It is becoming increasingly important to include the assessment of ESG risks in the lending process. EU institutions are actively addressing the role of Environmental, Social and Governance (ESG) information in the lending processes. EU regulations require financial institutions to assess their exposures in terms of risk management. Recognising these tendencies and drivers, and as part of its ongoing monitoring activities, from 2022, the MNB started to review the Hungarian and international ESG risk environment, requirements and policies. As a result of its review, the MNB has concluded that it is appropriate to integrate the ESG risks into the risk management process of the financial institutions' lending activities, the first step of which is the standardised collection of ESG information.

The MNB published a Recommendation on the use of an ESG questionnaire. To ensure the standardised collection of ESG information, the MNB issued Recommendation 9/2024 (IX.24.) on the use of a minimum set of questions to assess environmental, social and governance information in the underwriting, measurement, management and control of credit risk. The Recommendation aims to facilitate the collection of ESG information by a questionnaire, which must be completed by the borrower companies at the relevant credit institutions. The Recommendation aims to enable the Hungarian financial institutions and borrowers to assess their ESG risks and to integrate ESG risk assessment into the risk management processes of the financial institutions. Completing the questionnaire also contributes to raising awareness of sustainability, which supports the transition of the Hungarian economy related to sustainability. The Recommendation also aims to harmonise different banking practices: by a standardised questionnaire, corporate borrowers can answer the same basic set of questions, regardless of the lender, thus reducing the administrative burden.

The questionnaire covers 4 main topics. The first main topic is general questions, describing the company's basic parameters, such as size and business activity. The second topic is environmental sustainability (the "E" pillar of the ESG), which is based on the 6 objectives derived from the EU's environmental taxonomy[103]. The third topic is social risk-related requirements (the "S" pillar of the ESG), with particular attention to the special Hungarian features. The fourth topic covers issues related to corporate governance (the "G" pillar of the ESG).

The questionnaire is based on objective measurability and a risk and database-driven approach. When developing the questionnaire, the MNB placed great emphasis on ensuring that the questions were based on quantitative data, thereby facilitating objective measurability and response. The questionnaire is also characterised by a credit risk approach; the questions aim to assess the risks, with less emphasis on subjective aspects. Another criterion is that the answers to the questions should be stored in a database to facilitate future data disclosure and measurement.

Ensuring consistency with the ESG legislation[104] was key in developing the Recommendation. Building on previous successful collaborations, the MNB has discussed the questionnaire with several key organisations with in-depth knowledge and experience in the field. During an extensive technical consultation, the MNB received a number of useful comments on the draft, which have been incorporated into the Recommendation. Among the cooperation activities, the cooperation with the Supervisory Authority for Regulatory Affairs of Hungary (SARA), which is mandated by the ESG Act and has official authority functions, should be highlighted, whereby the institutions can continuously cooperate constructively, helping to improve the effectiveness, harmonisation and rationalisation of the ESG rules. As a result of the cooperation, the MNB and the SARA questionnaires are very similar: the harmonisation

[103] Regulation (EU) 2020/852 of the European Parliament and of the Council

[104] Act CVIII of 2023 on the rules of corporate social responsibility, taking into account environmental, social and societal aspects, to promote sustainable financing and unified corporate responsibility, and amending other related acts.

involved standardising questions on similar topics, including the wording of questions or even the units of measurement.

The MNB Recommendation entered into force on 1 January 2025 with a gradual application. The MNB requires the application of the Recommendation and the completion of the questionnaire in several phases, based on the borrower's company size and contract size. The gradual entry into force will give credit institutions and borrowers sufficient time to prepare. From 1 January 2025, among other tasks, financial institutions are required to educate the borrower companies by providing information on their websites. The completion of the questionnaire will be mandatory for borrowers from the following dates: for new corporate loans above HUF 500 million – from 1 July 2025, for new corporate loans above HUF 350 million – from 1 July 2026, for new corporate loans above HUF 200 million – from 1 July 2027, and new corporate loans above HUF 100 million – from 1 July 2028.

Box 9
NACE Rev. 2.1 (TEÁOR'25): the classification system got modernised, for more accurate green statistics

NACE[105] is the EU's statistical classification system of economic activities. The Hungarian equivalent of NACE is the TEÁOR system (Standard Sectoral Classification of Economic Activities), which is used to classify and statistically record the principal activities of companies. The classification system is designed to ensure the comparability of economic and green statistics and to support trend analysis and high-level decision-making on an international level. Its usefulness is further enhanced by the fact that the NACE system is based on the International Standard Industrial Classification (ISIC) structure defined by the UN, meeting the need for global comparability.

The rapidly changing economic and intensely challenging geopolitical environment has forced the modernisation of the NACE Rev. 2.0 nomenclature version, which has been in force since 2008. The work to renew the classification system started in 2018. 1,400 amendments have been proposed by the committees set up for this purpose, which shows the vastness of the task. Progress was slowed down by the COVID-19 pandemic and the complexity and constant expansion of the criteria system. Finally, the NACE Rev. 2.1 version (TEÁOR'25) was introduced on 1 January 2025.

Due to the transformation and expansion of economic activities, the total number of activity categories has increased from 996 to 1,042 in the new classification system. New activity categories have been added, and major changes have been made, dividing the former "*Information and communication"* sector according to the national economy sectors into *"Publishing, broadcasting, production of content and distribution activities"* and "*Telecommunications, computer programming, information technology consulting, computer infrastructure, and other information services*", and dividing the intermediary activities by sectors.

The restructuring of commercial activities also brought a change in methodology. The previous version used a distribution channel-based approach (such as retail sale in markets, retail sale not in stores), but in the new version, this is replaced by a product-based approach. Another change (showing an opposite trend) is the renewal of the "*Sale and repair of motor vehicles and motorcycles"* sector, where wholesale activities are now separated from the retail activities, and maintenance and repair activities. Focusing on the environmental aspects, it is worth mentioning that the former "*Electricity production*" category has been divided into "*Electricity production from renewable sources*" and "*Electricity production from non-renewable sources"* categories.

Overall, the introduction of the NACE Rev. 2.1 system is a major step forward in the realistic mapping of economic processes. First, it is expected to improve green statistics through the processing of company-level data according to the new activity codes, and also aims to contribute more effectively to successful environmental policy decision-making.[106]

[105] Nomenclature statistique des Activités économiques dans la Communauté européenne
[106] For more information, see the following link on the website of the Hungarian Statistical Office: Classifications – Standard Sectoral Classification of Business Activities (TEÁOR'25) – Central Statistical Office

4.4 DEVELOPMENTS IN THE FIELD OF INTERNATIONAL GREEN LEGISLATION IN 2024

The EU continued the fight against global warming through regulatory measures in 2024. New requirements have been introduced for the institutions on the integration and transparency of ESG aspects and risks, certain legislations on ESG disclosures have been clarified, and new regulation has been adopted related to the transparency and integrity of the ESG rating activities. The European Supervisory Authorities (ESAs) published reports on greenwashing, which set out recommendations to the European Commission and the national competent authorities.

On 2 April 2024, ESMA launched a consultation on its proposals to amend Annex I of the CRA Regulation on Credit Rating Agencies, and Commission Delegated Regulation (EU) No 447/2012[107]. One of the objectives of the proposed amendments was to integrate the ESG aspects into the credit rating methodologies and to ensure transparency.

In the Capital Requirements Regulation, the regulatory requirements related to ESG risks have been extended. Regulation No (EU) 2024/1623 of the European Parliament and of the Council (hereinafter referred to as "CRR3"), amending Regulation (EU) No 575/2013[108] (hereinafter referred to as the "CRR"), which entered into force on 9 July 2024 and is applicable from 1 January 2025, introduced common definitions[109] in the prudential regulatory system of credit institutions, in order to ensure a consistent understanding of the ESG factors and risks, including the following terms: environmental, social and governance (ESG) risk, environmental risk, physical risk, transition risk, social risk, governance risk. This is an important step forward in the effective application of the ESG risk regulations. The stress test scenarios used by the institutions to assess capital adequacy shall also cover the ESG risk factors. The ESG risk factors should also be taken into account in the market valuation of collaterals.

From 2025, all institutions subject to the CRR shall disclose their ESG risks. From 1 January 2025, all relevant institutions shall disclose information on an annual or semi-annual basis on the ESG risks, on a consolidated, sub-consolidated or individual basis, distinguishing environmental, social and governance risks, and physical risks and transition risks for environmental risks. Article 449a of the CRR specifies the information institutions shall disclose in relation to the ESG risks. Until 2024 (when CRR3 came into force), only large institutions issuing securities on a regulated market were subject to this obligation. From 2025, the ESG risk disclosure is mandatory for all credit institutions by the CRR3, and large subsidiaries of EU parent institutions will be obliged to publish sub-consolidated or individual-based disclosure as well. The uniform disclosure format and content for the ESG risks is specified by Commission Implementing Regulation 2022/2453 EU[110], applicable from 31 December 2022, for institutions that were subject to the obligation before the CRR3. The draft for the implementing technical standards, which will specify the extended requirements, will be developed by the EBA, and is currently in progress. The new implementing technical standard detailing the ESG disclosure requirements is expected to be applied for the first time by institutions from 2025 year-end, i.e. for year 2026.

[107] ESMA consultation

[108] Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and amending Regulation (EU) No 648/2012

[109] The new definitions are applicable from 1 January 2025.

[110] Commission Implementing Regulation (EU) No 2022/2453 of 30 November 2022, amending the implementing technical standards for environmental, social and governance risk disclosure set out in Implementing Regulation (EU) No 2021/637.

Table 4.3
Prudential information on ESG risks

Prudential information on ESG risks	Date of first application	Referenced section of the European Sustainability Reporting Standards (ESRSs) (if available for the given table)
Qualitative information on ESG risks		
Table 1 – Qualitative information on Environmental risks	31.12.2022	ESRS 2 SBM-1 Fossil fuel-related activities, section 40(d)(i)
Table 2 – Qualitative information on Social risks	31.12.2022	ESRS 2 SBM-1 Fossil fuel-related activities, section 40(d)(i)
Table 3 – Qualitative information on Governance risks	31.12.2022	
Quantitative information on ESG risks		
Table 1: Banking book- Indicators of potential climate Change transition risk: Credit quality of exposures by sector, emissions and residual maturity	31.12.2022	ESRS E1-1 Companies excluded from the EU benchmark indicators aligned to the Paris Agreement, sections 16(g) ESRS E1-6 Gross and total Scope 1, 2 and 3 GHG emissions, section 44
Table 2: Banking book – Indicators of potential climate change transition risk: Loans collateralised by immovable property – Energy efficiency of the collateral	31.12.2022	ESRS E1-9 Breakdown of the book value of the properties by energy efficiency rating, section 67(c)
Table 3: Banking book – Indicators of potential climate change transition risk: Alignment metrics	30.06.2024	ESRS E1-4 GHG emission reduction target, section 34 ESRS E1-6 Gross GHG emission intensity, sections 53–55

Prudential information on ESG risks	Date of first application	Referenced section of the European Sustainability Reporting Standards (ESRSs) (if available for the given table)
Table 4: Banking book – Indicators of potential climate change transition risk: Exposures to top 20 carbon-intensive firms	31.12.2022	
Table 5: Banking book – Indicators of potential climate change physical risk: Exposure to physical risks	31.12.2022	ESRS E1-9 Amounts broken down by acute and chronic physical risk, sections 66(a) ESRS E1-9 Location of major assets exposed to significant physical risk, section 66(c)
Table 6: Summary of key performance indicators (KPIs) on the Taxonomy-aligned exposures	31.12.2023	
Table 7 – Mitigation measures: Assets for the calculation of GAR	31.12.2023	
Table 8 – GAR (%)	31.12.2023	
Table 9 – Mitigation measures: BTAR (optional table)	31.12.2024	
Table 10 – Other climate change mitigating actions that are not covered in Regulation (EU) 2020/852	31.12.2022	

Table 1: ESG disclosure requirements for large institutions issuing securities on a regulated market (based on the effective EU Commission Implementing Regulation 2022/2453)

From 2025, the CRR3 extended the reporting obligation to also cover ESG risks. In order to adequately assess the ESG risks that institutions may face, it is essential that the competent authorities have sufficiently detailed, comprehensive and comparable data from the institutions exposed to such risks. The exposures to ESG risks shall include the total amount of the institutions' existing and new exposures to fossil fuel sector entities, and exposures to physical risks and transition risks. The draft implementing technical standard on disclosure will be submitted by the EBA to the European Commission by 10 July 2025. When developing the requirements, the EBA should ensure that the level of detail required is consistent with the principle of proportionality, taking into account the size and complexity of the relevant institutions, and whether the exposure to the ESG risks is material.

Article 501a of the CRR was amended to ensure that any adjustment for exposures for infrastructure do not undermine the EU's climate ambitions. Thus, the adjustment to own funds requirements for credit risk for new exposures (originated after 1 January 2025) will only apply, provided that the assets being financed contribute positively to one or more of the environmental objectives set out in the Taxonomy Regulation[111], and do not significantly harm the other objectives set out in the Taxonomy Regulation, or that the assets being financed do not significantly harm any of the environmental objectives set out in the Taxonomy Regulation. A new provision has also been introduced, applicable from 1 January 2025, on that the stress test scenarios used in assessment of the capital adequacy of the institutions shall also include the ESG risk drivers. From 1 January 2025, the valuation of collateral shall also include the ESG-related valuation considerations.

In addition to the CRR, the CRD was also amended. The integration of ESG aspects required an amendment to Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms[112] (hereinafter referred to as the "CRD"). Directive 2024/1619 of the European Parliament and of the Council amending the CRD entered into force on 9 July 2024. EU Member States shall adopt and publish the laws, regulations and administrative provisions necessary to comply with this Directive by 10 January 2026. For more detailed information, see Chapter 4.5.

There was also a need to clarify the ESG disclosure rules. The specific plans to address the ESG risks faced by institutions, as required by the CRD, should be consistent with the sustainability targets and commitments disclosed under the CSRD. The Corporate Sustainability Reporting Directive (CSRD) came into force on 1 January 2023, replacing the requirements introduced by the previously applicable Non-Financial Reporting Directive (NFRD) (described in detail in the May 2024 Green Finance Report, in sub-chapter 4.4: International Developments in 2023, also including further information on the CSRD). Based on the general disclosure requirements developed by the EFRAG, the Commission Delegated Regulation on ESRSs[113] was also published, adopted in December 2023. The ESRS translates the requirements of the CSRD into practice, in the form of standards. The adopted set of sector-neutral standards currently includes two comprehensive standards, and a total of 10 thematic standards (5 standards cover environmental, 4 cover social and 1 covers corporate governance-related issues). At the request of the Commission, EFRAG has developed several implementation guides and a Q&A in 2024, to facilitate the implementation of the first round of the ESRS standards.

ESMA published its guidelines on the Enforcement of Sustainability Information[114] on 25 July 2024. The rules for the supervision of the issuers' sustainability reports will be based on these guidelines. The Commission's Communication C/2024/6792 was published on 13 November 2024, which includes an FAQ to clarify the interpretation of certain provisions of the CSRD. ESMA published a statement "*Off to a good start: first application of ESRS by large issuers*"[115] on 5 July 2024, which highlights the key areas that ESMA considers to be of particular importance in the preparation of the sustainability statements under the ESRS, in order to support the implementation of the CSRD and the ESRS.

[111] Regulation (EU) 2020/852 of the European Parliament and of the Council establishing a framework for the promotion of sustainable investment and amending Regulation (EU) 2019/2088

[112] Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC.

[113] Commission Delegated Regulation (EU) 2023/2772

[114] Final Report on Guidelines on Enforcement of Sustainability Information (GLESI)

[115] Off to a good start: first application of ESRS by large issuers

The CSRD has been implemented in the Hungarian legislation. The implementation of the provisions of the Accounting Directive[116] as amended by the CSRD into Hungarian law was carried out by the ESG Act, amending Act C of 2000 on Accounting and Act LXXV of 2007 on the Hungarian Chamber of Auditors, Auditing Activities and the Public Supervision of Auditors. PM Decree No. 24/2008 (VIII. 15.) was also amended, according to which the issuers' annual reports must include an assurance opinion on the sustainability reports. The management report shall include the auditor's assurance opinion and report, and a statement that the management report has been prepared in accordance with the Sustainability Reporting Standards and with the reporting requirements provided for in the Article 8(4) of the Taxonomy Regulation.

The Directive amending the AIFMD[117] and UCITS[118] guidelines entered into force on 15 April 2024[119]. The provisions of the Directive must be implemented by Member States by 16 April 2026. Thus, Member States should, inter alia, ensure that AIFMs and UCITS management companies applying for authorisation also provide information in their submitted business plans on whether they intend to comply with Article 3(1)[120], Article 6(1)[121] and Article 13[122] of the SFDR.

The Prospectus Regulation was amended[123] at the end of 2024. As a result of the amendment, issuers asking for admission to trading on a regulated market are required to incorporate by reference in the Prospectus, a management report and a consolidated management report, for the periods covered by the historical financial information, which also include the sustainability reporting. Furthermore, by 5 June 2026, the Commission shall adopt delegated acts in relation to the Environmental, Social and Governance related information to be disclosed in the Prospectus, for non-equity securities issued as taking ESG factors into account or pursuing ESG objectives.

Changes to the relevant Article of the SFDR[124] on marketing communications, and the introduction of a single European access point. From 1 January 2028, institution-level website disclosures under the SFDR shall be submitted by financial market participants subject to the SFDR to the designated collection organisation at the same time as they are published, to ensure their availability at the single European access point. The relevant Article of the SFDR on marketing communications has been amended to bring it in line with Regulation 2024/3005 of the European Parliament and of the Council on the transparency and integrity of Environmental, Social and Governance (ESG) rating activities (hereinafter referred to as the "ESG-rating Regulation") (effective from 1 January 2025 and applicable from 2 July 2026). The ESG-rating Regulation, applicable from 2 July 2026:

i. regulates the issuance, distribution and, where appropriate, the publication of ESG-ratings;

ii. requires the application for authorisation of legal person establishes in the Union that wish to operate in the Union as an ESG rating providers;

iii. requires ESG-rating providers to use rating methodologies that are rigorous, systematic, independent and capable of justification and that apply continuously and in a transparent manner;

iv. introduces organisational requirements to prevent and mitigate potential conflicts of interest;

[116] Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC.

[117] Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010.

[118] Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS).

[119] Directive (EU) 2024/927 of the European Parliament and of the Council amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory authority reporting, the provision of depositary and custody services and the granting of loans by alternative investment funds.

[120] Article 3 (1) of the SFDR: Financial market participants are required to publish information on their policies for integrating the sustainability risks into their investment decision-making processes on their website.

[121] Financial market participants are required to indicate in their pre-contractual disclosures either how they integrate sustainability risks into their investment decisions, or that they do not consider sustainability risks to be relevant.

[122] Financial market participants must ensure that their marketing communications do not contradict the information they published under the SFRD.

[123] Regulation (EU) 2017/1129 of the European Parliament and of the Council of 14 June 2017 on the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market, and repealing Directive 2003/71/EC.

[124] 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.

v. establishes disclosure requirements for the methodologies, models and key rating assumptions used in the ESG-rating activities and in specific ESG rating products; and

vi. sets out the requirements for the ongoing supervision of ESG-rating providers in the EU.

Pursuant to Articles 6(3), 12(9), 16(5), 23(4) and 24(3) of the ESG-rating Regulation, ESMA shall develop the draft regulatory-technical standards, which shall be submitted to the European Commission by 2 October 2025.

The list of economic activities aligned with the EU taxonomy is extended. The Environmental Delegated Act[125], applicable from 1 January 2024, regulates:

i. whether a particular economic activity contributes significantly to the sustainable use and protection of water and marine resources, to the transition to a circular economy, to the pollution prevention and control, or to the protection and restoration of biodiversity and ecosystems; and

ii. the technical assessment criteria for determining that a particular economic activity does not significantly harm the other environmental objectives set out in Article 9 of the Taxonomy Regulation.

ESMA published guidelines on funds' names in 2024. ESMA published its Guidelines on funds' names using ESG or sustainability-related terms (hereinafter referred to as the "Guidelines on funds' names") on 21 August 2024. The Guidelines on funds' names have not yet been implemented in Hungary, as of the publication of this report. The Guidelines on funds' names apply to UCITS management companies, alternative investment fund managers, money market fund (MMF) managers and the competent public authorities. The Guidelines on funds' names specify detailed requirements for the use of specific terms related to Environmental, Social and Governance (ESG) or sustainability by funds in their names, as well as requirements for the use of terms related to transition, social and governance, environmental, impact, and sustainability. The Guidelines on funds' names also provide a detailed explanation of each term. On 13 December 2024, ESMA published a Q&A with 3 new questions[126] on the application of the Guidelines on funds' names.

The European Green Bond Regulation[127] is applicable from 21 December 2024. The Regulation sets out uniform requirements for bond issuers wishing to use the designation "European Green Bond" (EuGB) for their environmentally sustainable bonds. The European Green Bonds will be aligned with the EU taxonomy for sustainable activities (described in more detail in sub-chapter 4.4 of the Green Finance Report 2024 issued in May 2024, and further information on the draft RTS and ITS related to the Regulation can be found in Chapter 4.5).

The joint opinion paper of the ESAs on the SFDR was published on 18 June 2024. The opinion paper addresses the following issues: the classification system of financial products that have sustainability features (Sustainable product category / Transition product category), the introduction of sustainability indicator, revision of the SFDR Article 2(17) definition of "sustainable investment", the extension of the SFDR definition of "financial product", simplification of the pre-contractual financial product disclosures, improvement of the transparency of product-level PAI[128], and the introduction of a framework to assess sustainability features of government bonds. The ESAs recommend that the Commission carry out consumer testing and research before proposing policy changes, which will serve as the basis for changes to the regulatory environment and ensure their success. The joint opinion paper of the ESAs may be taken into account by the Commission in the revision of the SFDR, scheduled for 2025 Q4.

The Sustainable Finance Platform published its proposal for the categorisation of the financial products covered by the SFDR[129] on 17 December 2024. The Platform proposes 3 categories: sustainable (sustainable investments under the EU taxonomy or SFDR), transition (investments or portfolios supporting the transition to net zero and

[125] Commission Delegated Regulation (EU) 2023/2486, supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to the sustainable use and protection of water and marine resources, to the transition to a circular economy, to pollution prevention and control, or to the protection and restoration of biodiversity and ecosystems and for determining whether that economic activity causes no significant harm to any of the other environmental objectives and amending Commission Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities.

[126] ESMA puts forward Q&As on the application of the Guidelines on funds' names

[127] Regulation (EU) No 2023/2631 of the European Parliament and of the Council of 22 November 2023 on European Green Bonds and optional disclosures for bonds marketed as environmentally sustainable and for sustainability-linked bonds.

[128] Main adverse impacts on the sustainability factors.

[129] Categorisation of products under the SFDR: Proposal of the Platform on Sustainable Finance

a sustainable economy), and ESG collection (products with better environmental and / or social criteria or applying sustainability features, excluding significantly harmful investments / activities). All other products should be identified as unclassified products under the proposal. The categories aim to reflect the overall sustainability objectives of the financial products, focusing on the needs of retail investors. The Platform's proposals may be taken into account by the Commission in the revision of the SFDR, scheduled for 2025 Q4.

The ESAs published their individual reports on greenwashing on 4 June 2024. In May 2022, the Commission requested the ESAs to prepare a report delivering advice on greenwashing risks and sustainability-related supervision.

The ESMA Greenwashing Final Report[130] investigates the role of the supervisory authorities' supervision in mitigating the greenwashing risks and makes proposals on how supervision could be gradually enhanced in coming years. Based on the findings of the Greenwashing Progress Report and the Greenwashing Final Report, on 24 June 2024, ESMA published its Opinion titled "*Sustainable investments: facilitating the investor journey – A holistic vision for the long term"*. This Opinion includes recommendations to the national authorities and the European Commission. ESMA also plans to publish further guidelines in 2025 to support the supervision conducted by the national competent authorities, on the basis of the findings and recommendations of the Greenwashing Final Report. ESMA also plans to issue guidelines and a report for financial market participants on sustainability-related statements, titled "*Using NLP to detect potential greenwashing activities*".

The EBA Greenwashing Final Report[131] takes a deeper look on the actual and potential alleged greenwashing occurrences. It provides updates how greenwashing can have adverse impact on the financial risks of institutions and consumers and makes recommendations to the national authorities and the Commission. The report finds that the number of greenwashing occurrences increased in all sectors in the period between 2012 and 2023. EBA plans to incorporate the ESG and greenwashing aspects into the EBA Guidelines to be issued in 2025 Q3, on the topic of product supervision and governance measures for retail banking products (EBA/GL/2015/18).

The EIOPA Greenwashing Final Report[132] presents the survey conducted by the EIOPA on greenwashing. The EIOPA also makes recommendations to the Commission based on its survey. 16 national competent authorities participated in the survey. EIOPA has identified opportunities for improvement and amendment, inter alia, with regard to Article 10 of the SFDR, noting that the integration of the sustainability-related objectives in the product supervision and governance process is not adequate. According to the report, the lack of standards for non-life insurance products with sustainability features can lead to a higher risk of greenwashing. The report provides practical guidance on how to apply the principles, with real examples of good and bad practices. EIOPA also published its Opinion paper on greenwashing and sustainability claims, complementing its report. In this Opinion titled "Opinion on sustainability claims and greenwashing in the insurance and pensions sectors"[133], EIOPA has determined four key principles for the competent authorities supervising the insurance sector (among other areas) to stop the practice of greenwashing and for their assessment of sustainability claims. Although the Opinion is addressed to the competent authorities, given that it has specified requirements that shall be enforced in the course of the supervisory activities, other market participants involved in the sectors regulated by EIOPA and their products, i.e. (re)insurers and their insurance products, are also required to apply the principles described, when making sustainability claims (i.e. for example when naming products).

4.5 EXPECTED CHANGES IN GREEN LEGISLATION, RECOMMENDATIONS AND DATA REPORTING134

The legislative framework for sustainability will be further developed in the coming years. The sector-specific regulations adopted in previous years will gradually enter into force after their preparatory periods have expired. A number of secondary-level regulatory, implementation guidelines, recommendations and reporting summaries are also expected to be published. At the same time, as a result of the review announced in November 2024 to "improve competitiveness in the EU and to boost the economy", the provisions of the first Omnibus proposal package are

[130] Final Report on Greenwashing
[131] Greenwashing monitoring and supervision
[132] EIOPA's Final Report and Opinion on Greenwashing – Advice to the European Commission
[133] EIOPA's Final Report and Opinion on Greenwashing – Advice to the European Commission
[134] The summary is provided up to 31 March 2025.

expected to lead to the simplification of obligations and a reduction in the administrative burden placed on market participants. However, until the adoption of the final amending provisions, significant challenges are expected to remain in the application of the law.

The scope of the sustainability framework is further extended to a new market segment. The provisions of the EU Regulation on markets in crypto-assets[135] (MiCA) applicable to crypto-asset providers have entered into force, and will be fully applicable in Hungary from 1 July 2025, after a transitional period. Directive 2015/849[136] placed crypto-asset service providers within the definition of "financial institution"; from 1 January 2025, they will be supervised by the MNB, instead of the National Tax and Customs Authority (NAV). The rationale behind these new and partially amended regulation lies in the fact that the consensus mechanisms used to approve crypto-asset transactions could have significant adverse effects on the climate, and other harmful effects on the environment. Such consensus mechanisms therefore should introduce more environmentally friendly solutions and crypto-assets service providers must ensure that the potential major adverse impacts on the climate and other adverse impacts on the environment are properly identified and disclosed. Under the new rules, crypto-asset providers are required to make available the relevant disclosures in the crypto-assets white papers, as well as on their websites. Under the mandate set out in MiCA, ESMA – in cooperation with EBA – will develop the draft regulatory-technical standards to lay down the detailed rules. In this process, ESMA should take into account the current disclosure requirements and ensure that the new regulation is supplementary and consistent and does not increase the burdens on companies.

EU Member States, however may introduce transitional periods according to the rights conferred by the MiCA. These provisions allow existing crypto-asset service providers to continue operating on the basis of their pre-MiCA licences, and notifications submitted to the national authorities on their business activities, while they transition to the new regulatory framework. In Hungary, due to the transitional period set by the Act on markets in crypto-assets[137], the new requirements will apply from 1 July 2025.

Expected Developments[138] Related to the CSRD Directive. Under the currently applicable rules, due to the phased implementation, the scope of entities required to disclose sustainability-related information will gradually expand. Entities subject to the obligations must prepare sustainability reports in a standardised format from 2025 for the first time. The new regulation will first apply only to large entities of public interest from 2025, regarding their 2024 activities. Based on the current rules, the CSRD will apply to all large entities from 2026 and to all SMEs of public interest from 2027. At EU level, the regulation is expected to affect approximately 50,000 companies. EFRAG will also take part in the development of the second set of standards related to the CSRD, to continue the work started in 2022. These standards will complement the existing ESRS requirements with additional standards and will also include further sector specific requirements for specific industries, SMEs and non-EU companies, and will be applicable from mid-2026. The purpose of applying the sector-specific standards from a later date is to facilitate the adaptation of the non-sector-specific ESRS first and to reduce the administrative burden for companies.

A new set of rules has been adopted, requiring large companies to reduce their adverse impact on human rights and the environment. The Corporate Sustainability Due Diligence Directive 2024/1760/EU (CSDDD) was adopted on 13 June 2024, and under the current rules, Member States are required to implement it into their national legislation by 26 July 2026. As part of this, Member States have to designate one or more supervisory authorities to monitor compliance with the obligations laid down in the Directive. The CSDDD requires a gradual implementation, starting on 26 July 2027 to large companies. The regulation is based on three main elements:

1. obligation for companies to identify and prevent, mitigate or bring to an end actual and potential adverse impacts on human rights and the environment arising from their own activities, those of their subsidiaries and, where related to the values chain, from the operations of their business partners;

2. liability for non-compliance with these obligations; and

[135] Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets,and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937.

[136] Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC.

[137] Act VII of 2024 on the market in crypto-assets

[138] Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU on corporate sustainability reporting.

3. obligation to adopt and implement transition plan for climate change mitigations.

Regulatory developments are also expected in the implementation of the EU Sustainable Finance Strategy. The changes aim to significantly simplify and reduce the administrative burden on companies and increase competitiveness. On 26 February 2025, the European Commission published its first set of proposals (Omnibus I) to amend some of the key pillars of the European Green Deal. This includes proposed simplifications to the CSRD, the related accounting[139] and auditing guidelines[140], and the proposal to simplify the CSDDD Directive on corporate sustainability due diligence and the rules on the Carbon Border Adjustment Mechanism (CBAM). The proposal focuses on reducing the administrative burden[141] on companies, particularly SMEs, and enhancing competitiveness. If adopted, these amendments may enter into force 12 months after their publication. The new rules will apply after a further one-year period for implementation by the Member States. It should be emphasised that due to the complexity of the sustainability regulation and the different priorities of the EU Member States, the final text of the law may substantially differ from the currently published proposal.

The main elements of the "Omnibus I" proposal package is designed to enhance competitiveness. The combined aim of the proposed amendments is to reduce regulatory overlap, eliminate inconsistencies and thereby significantly reduce the administrative burden on companies. They aim to ensure a major simplification of the data reporting on sustainable finance, corporate sustainability due diligence and taxonomy. The first and most important set of specific proposals concerns the postponement of the implementation and application deadlines for the CSDDD (the so-called "stop-the-clock" proposal). For companies that are not required to prepare a sustainability report in 2025 under the current provisions, the Omnibus I proposal package proposes a 2-year postponement in terms of the CSRD, while for the CSDDD, the transposition deadline is postponed by one year, and the application deadline by another year, until 26 July 2028. The proposal was approved by the European Parliament in April 2025.

Another significant amendment proposal is the alignment of the employee thresholds triggering reporting and due diligence obligations under the CSRD and the CSDDD. As a result, companies with fewer than 1,000 employees would be exempted from the mandatory requirements of the two directives. The proposal, including substantial amendments, plans to significantly reduce the number of companies required to prepare a sustainability report. Thus, for the 2027 financial year (and subsequent financial years), only those large companies whose average number of employees exceeds 1,000 on the balance sheet date would be required to prepare a sustainability reports (i.e. waves II and III under the CSRD would be removed). For companies with fewer than 1,000 employees, the sustainability framework would remain open on a voluntary basis, with the so-called VSME incentive (voluntary standards for SMEs), a set of standards tailored to SMEs for their sustainability reporting. At the same time, the obligation to develop sector-specific standards for SMEs in addition to the ESRS standards, as required by the current legislation, would be cancelled.

The Omnibus I proposal would amend the limited and reasonable assurance provisions of the Audit Directive, making it sufficient to provide only limited assurance certification, based on a standard to be adopted by the European Commission by 2026. It would also introduce reporting obligation under Article 8 of the Taxonomy Regulation for entities submitting Opt-in statements. Furthermore, the Omnibus I plans to increase the harmonisation of the due diligence requirements, align the requirements for the adoption of transition plans for climate change mitigation, with the CSRD, while eliminating harmonised civil liability requirements at EU level. The Omnibus I proposal specifically addresses the "trickle-down effect", i.e. that it must be ensured that smaller companies in the supply chains are not burdened with excessive data requirements not intended to apply to them. The proposals relax the CBAM-related requirements for smaller importers, in particular SMEs and public authorities. The effects of the Omnibus I proposal package as of 31 March 2025 are summarised in Table 3 of the Appendix.

The public consultation process on the draft Commission Regulation amending the Commission Delegated Regulations related to the Taxonomy Regulation[142] was

[139] Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC.

[140] Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC.

[141] Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a carbon border adjustment mechanism.

[142] Disclosures Delegated Act, Taxonomy Climate, Environmental Delegated Act

closed on 26 March 2025. For the Disclosures Delegated Act, the proposal would significantly simplify the disclosure templates and introduce a materiality threshold for financial and non-financial enterprises for all KPIs. For the Taxonomy Climate and Environmental Delegated Act Regulations, the Commission plans to review all technical assessment criteria, with a particular focus on the most complex DNSH criteria for pollution prevention and control.

EBA prepares a series of reports, based on the mandate provided by the CRR[143], aimed at developing the requirements for a prudent treatment of exposures to environmental and social factors. The report on the availability of data, and the feasibility of a common methodology, in relation to the ESG risks was published on 24 February 2025[144], the main finding of which is that significant progress has been made in assessing the ESG risks, but the efforts to take into account the impact of the ESG factors on credit risk are still at an early stage. However, the possible building blocks for the feasibility of introducing a standard methodology for the identification and rating of exposures are not yet sufficiently developed. The next report on this topic is expected in early 2026, in which the EBA will examine the actual risk of exposures to assets and activities affected by environmental or social factors relative to the riskiness of other exposures, and the potential short, medium and long-term effects of the adjusted, individual prudential treatment of these exposures on financial stability and bank lending in the EU.

As a result of the integration of the ESG aspects, Directive 2013/36/EU (hereafter referred to as the "CRD") was also amended. Directive 2024/1619 of the European Parliament and of the Council amending the CRD entered into force on 9 July 2024. Member States shall adopt and publish the laws, regulations and administrative provisions necessary to comply with the Directive by 10 January 2026, including, but not limited to, the following:

i. institutions must be able to systematically identify, measure and manage ESG risks;

ii. institutions must assess the alignment of their portfolios with the EU's 2050 climate neutrality objective, and with targets for pollution prevention and biodiversity preservation;

iii. institutions must prepare specific plans to address financial risks arising from ESG factors in the short, medium and long term;

iv. institutions must establish reliable corporate governance frameworks and internal processes to manage ESG risks, and must have strategies approved by their governing bodies that take into account not only current but also future impacts of the ESG factors;

v. institutions must ensure that their management bodies have adequate collective knowledge of the ESG factors, and that they have an appropriate internal capital allocation to manage the ESG risks;

vi. institutions must integrate the promotion of sustainable development into their policies and activities;

vii. the risk appetite of institutions for ESG risks must be an integral part of their remuneration policies and practices.

In addition, the CRD requires competent authorities to consistently consider ESG risks in their relevant supervisory activities, including in the supervisory review and assessment process and the stress testing of the relevant risks. Furthermore, if the competent authorities consider that the climate-related risks may have serious adverse consequences for the financial system and the real economy of the Member States, they shall introduce a systemic risk capital buffer rate in accordance with the provisions of the CRD.

EBA published its guidelines on ESG risk management[145] on 9 January 2025. EBA is mandated under the CRD to issue guidelines on minimum standards and reference methodologies for the identification, measurement, management and monitoring of environmental, social and governance (ESG) risks by institutions. The guidelines apply from 11 January 2026, except for small and non-complex institutions[146]. In order to ensure the short, medium and long-term resilience of the institutions' business models and risk profiles, the guidelines describe the internal processes and ESG risk management rules that the institutions should have in place. According to the guidelines, the institutions must ensure the following:

[143] Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and amending Regulation (EU) No 648/2012

[144] The EBA finds progress in availability and accessibility of data used to identify and qualify environmental, social and governance risks

[145] Final Guidelines

[146] For small and non-complex institutions, the guidelines will apply from 11 January 2027.

i. based on a regular and comprehensive materiality assessment of the ESG risks, the institutions must ensure that they are able to properly identify and measure ESG risks using a combination of reliable data processes and methodologies;

ii. thy must integrate the ESG risks into their normal risk management frameworks;

iii. they must have robust and well based approach to manage and mitigate ESG risks in the short, medium and long term (for at least 10 years), and use a range of risk management tools;

iv. they must develop specific plans to address the risks arising from the economy's transition and adaptation process to the regulatory objectives for the ESG factors, taking into account short, medium- and long-term time horizons.

The latest amendment to the Solvency II Directive[147] will strengthen the role of the insurance and reinsurance sector in the green transition. The aim of the amendments is to provide long-term, private investment for the green transition, for European companies. The most recent review of the Solvency II Directive concerning the conduct of insurance and reinsurance activities was published in the Official Journal of the European Union on 8 January 2025, with transposition required by 29 January 2027. The relevant amendments to the Hungarian sectoral legislation are expected as well. The reason of the Solvency II revision was to align the framework with the European Green Deal, which will require substantial investments from the private sector, including from insurers, to be channelled towards sustainable investment. Therefore, the capital requirement-related provisions of the Solvency II Directive should not prevent sustainable investments by insurers, but should reflect the full risk of investing in environmentally harmful activities.

The most important innovation of the proposed amendments to the Solvency II Directive in terms of sustainability is risk management. Via the amendment, the sustainability risks over short-, medium-, and long-time horizons are integrated into the risk management process of the insurers. Institutions need to develop specific plans to address the financial risks arising from the sustainability factors and monitor their implementation. In addition, the amendment also explicitly requires that when developing the sustainability plans, "*the latest reports of the European Climate Change Advisory Panel, and the latest measures required by the Panel shall be considered"*[148]. The requirement for insurers to analyse climate change scenarios is also a new element in the regulation, which aims to identify and assess risks in order to identify the material exposures. Overall, the amendment ensures the consistent integration of sustainability risks into the risk management system of insurers, by supplementing several provisions of the Directive. To ensure that the disclosure requirements do not impose an excessive burden on the institutions, the amendment also introduces some simplification and proportionality measures. The Accounting Directive is also amended for the same purpose, to allow small and non-complex insurers to apply the simplified sustainability reporting rules for SMEs specified in the Directive. EIOPA has been mandated to prepare additional regulations and a significant number of second-level regulatory measures (ITS, RTS, guidelines), and to prepare a sustainability risk report.

Sustainability is a priority for EIOPA, based on its strategic priorities for 2025-2027[149]. Among other things, the EIOPA is working to address the challenges of the green transition, integrating the ESG considerations and mitigating the risk of greenwashing. In terms of the revision of Solvency II, EIOPA is involved in drafting several new technical standards and guidelines, and the revision of existing ones. Soon, further sustainability risks such as biodiversity and social risks will be at the forefront of policy making, and data quality, data availability and the development of adequate analytical models for existing data will continue to be of paramount importance. Connected to the revision of Solvency II, a dedicated report on biodiversity risks and guidelines for climate stress tests are also expected to be published. In addition, as the sustainable financial framework has evolved over the past years, EIOPA's work is expected to shift from rule-making to enforcement and supervision.

EIOPA launched a public consultation on the draft RTS. Among the secondary regulatory measures related to the Solvency II Regulation, EIOPA has issued for public consultation the draft RTS on sustainability risk management

[147] Directive (EU) 2025/2 of the European Parliament and of the Council of 27 November 2024 amending Directive 2009/138/EC as regards proportionality, quality of supervision, reporting, long-term guarantee measures, macro-prudential tools, sustainability risks and group and cross-border supervision, and amending Directives 2002/87/EC and 2013/34/EU.

[148] Article 44 (2b) of Solvency II

[149] Final Single Programming Document 2025-2027, Including Annual Work Programme 2025 EIOPA-BOS-24/581 2024. december 17.

and sustainability risk plans on 4 December 2024[150]. The consultation aims to ensure a coherent and proportionate approach to identifying and managing sustainability risks and for developing relevant risk mitigation plans. The plans must be aligned with the existing regulatory measures such as ORSA[151] (Own Risk and Solvency Assessment) and must provide a comprehensive picture of the relevant risks of companies, and the measures adopted to mitigate them, in line with their transition efforts. The consultation period closed on 26 February 2025.

ESMA also continues its work on green bonds. On 14 February 2025, ESMA published and sent to the Commission for adoption the following draft regulations related to the European Green Bond Regulation[152]: a draft regulatory-technical standard (based on Articles 23(6), 27(2), 28(1), 33(7) of the Regulation), and two draft implementing technical standards (based on Article 23(7) of the Regulation). The draft RTS lays down assessment criteria for:

(i) the reputation, professional qualifications, knowledge and experience of the senior management and board members of external auditors, and

(ii) the knowledge, experience and qualifications of the analysts and employees of external auditors.

One draft ITS includes the criteria for assessing the ability and capacity of third-party service providers to carry out the evaluation activities in a reliable and professional manner.

The other draft ITS sets out the standard forms and model documents to be used in the procedure for registration as an external auditor of European Green Bonds.

ESMA is working on developing further draft regulatory technical standards on the basis of Articles 24(2), 26(3), 29(4), 30(3), 31(4), 42(9) of the European Green Bond Regulation, planned to be submitted to the Commission by 21 December 2025[153].

The public consultation announced on the Commission's Regulation on the content, methodology and presentation of model documents to be used by the issuers of bonds marketed as environmentally sustainable, or related to sustainability, in post-issuance voluntary disclosures[154] was closed on 28 January 2025. The Regulation is expected to be adopted in 2025.

[150] *Draft RTS on sustainability risk management including sustainability risk plans*: Consultation on the proposal for Regulatory Technical Standards on management of sustainability risks including sustainability risk plans – Solvency II Review – EIOPA

[151] Own Risk and Solvency Assessment

[152] ESMA: Final Report

[153] The draft regulatory technical standards will cover, inter alia:
i. the criteria for assessing the adequacy, suitability and effectiveness of the external auditors' systems, resources and procedures
ii. the criteria to assess the prudent and sound management of the external auditor, and the management of conflicts of interest.

[154] Green bonds and sustainability-linked bonds

5 Green finance-related capacity building

Addressing the risks posed by climate change has become a core requirement for Hungarian financial institutions. In light of increasingly stringent regulatory requirements and rising societal expectations, there is a growing demand for professionals who possess expertise in green finance and can effectively navigate the dynamic legal landscape. Recognising this, the MNB is actively collaborating with several Hungarian higher education institutions to deepen green finance knowledge among students. In addition to education, research is seen as a cornerstone of innovation and development in this field. The MNB believes that meaningful progress in the fight against climate change is contingent upon cutting-edge research. Therefore, the MNB supports both national and international academic initiatives aimed at advancing knowledge in green finance.

5.1 THE MNB'S GREEN FINANCE-RELATED EDUCATIONAL ACTIVITIES

In recent years, there has been a growing demand in the labour market for professionals with expertise in green finance. The MNB's Green Programme focuses on increasing young people's financial literacy with an environmentally conscious approach. This includes not only teaching sustainable finance but also incorporating the various aspects of environmentally conscious lifestyle. To facilitate this, the MNB strongly supports educational initiatives that offer green finance courses, integrated into the training program of partner institutions.

The MNB actively cooperates with several Hungarian universities on educational programmes. The cooperation ranges from teaching full courses (at the John von Neumann University (NJE), the University of Szeged (SZTE), the Budapest Metropolitan University (METU), the Budapest University of Technology and Economics (BME)) to guest lectures (at the University of Debrecen and the National University of Public Service (NKE)).

1. In 2024, the NJE Faculty of Business and Economics offered two interconnected subjects. First, the students were introduced to the basics of sustainability and the relationship between the economy and finance in an introductory course on Sustainable Finance. After successfully completing the foundation course, students could continue their studies in the "Sustainability Case Studies" course, where they could deepen their knowledge in a small-group, workshop-based teaching format.

2. The MNB works in close cooperation with the research centre of the Faculty of Economics of the University of Szeged and the Institute of Finance and International Economic Relations in the field of sustainability-related economic education activities. In 2024, MNB experts also participated in teaching the "Introduction to Sustainable Finance" subject and the "Finance and ESG Reporting" subject in English at the Master's degree course.

3. METU held two further training courses ("Financial Regulatory and Supervisory Expertise" and "Sustainability Management"), which were taught by MNB experts, who introduced students to the theoretical and practical context of sustainability and green finance.

4. For the second year in a row, the BME MBA Master's degree course in "Sustainable Finance" was held with the participation of MNB experts. MBA students and students of the accounting faculty also attended the course, which focused on topics such as understanding green financial products, ESG, the green role of central banks and specific ways of financing sustainability.

5. The University of Debrecen has launched a course called "Sustainable Economics of the Future" in the fall semester of the 2024/2025 academic year, intending to introduce students to the pillars of long-term, sustainable economic growth: financial, social, real economy and ecological sustainability.

6. A lecture was also held at the NKE, at the Master's degree course in Governance and Management, under the subject "International Economy and Foreign Economy", which focused on sustainable finance from the perspective of international cooperation.

5.2 PARTICIPATION IN TECHNICAL ASSISTANCE PROGRAMMES

The MNB continued to play an active role also in the Technical Assistance Programme in 2024. The Task Force on Central Bank Cooperation within the European Central Bank's (ECB) International Relations Committee is implementing an EU-funded regional project for the

Western Balkan counties in two phases, in the years 2019–2021 and 2022–2025, in which the MNB is also participating. The project focuses on capacity building at the central banks and supervisory authorities of potential new EU Member States, by transferring good practices and experiences from the current Member States. In the framework of the EU's Western Balkans Catch-up Project, the MNB had a bilateral cooperation with the National Bank of Serbia, with an expert visit to Belgrade on 16–17 May 2024. The knowledge transfer focused on the greening of the monetary policy and the financial system, with presentations by MNB experts on the MNB's Green Programme, sustainable investment strategies and experiences in greening the FX reserve management activities.

The MNB's own Technical Assistance Programme also makes sustainability a priority. Launched in 2023, this MNB initiative aims to strengthen the international networking activities, foster closer cooperation with foreign partners and promote dialogue on central bank issues. Interest in the 2024 seminar series "From Tradition to Innovation" continued to grow in the second year of the programme: in 2023, 95 participants from 21 institutions attended the 10 training days, while in 2024, a total of 108 central bank experts from 26 countries attended the 16 training days. As in 2023, the majority of the participants arrived from the Central, Eastern and South-Eastern Europe (CESEE) region. The professional programme has also been expanded, with 57 speakers from the MNB contributing to the exchange of experience with a total of 57 presentations, 14 interactive group work sessions and round table discussions during 2024. During the seminar "Green and Sustainable Finances – Introducing the MNB's Green Program" held on 22-25 April 2024, central bank experts from 15 countries around the world, including the Philippines, Cambodia, Indonesia, Oman and the Balkans, were able to learn about the MNB's unique Green Programme, and gain in-depth and comprehensive knowledge about the MNB's sustainability efforts, its carbon footprint reduction programme and the implementation of its climate stress tests, among other topics. The MNB experts also presented the most pressing issues of greening the monetary policy and climate risk management, with practical insights through small group exercises and workshops.

5.3 SCIENTIFIC AWARDS AND SUPPORTING RESEARCH

The MNB announced the Green Finance Science Awards and the Green Finance Science Research Initiative every year since 2021. In order to promote environmental sustainability and to recognise outstanding green finance researchers from Hungary and abroad, the MNB established the Green Finance Science Awards and launched the Green Finance Science Research Initiative. As part of the initiative, two award categories and the Research Initiative were announced in 2024. The *International Green Finance Lifetime Achievement Award* was not awarded in 2024, as this category is awarded every two odd-numbered years. The awards are decided by an open nomination process, and after the evaluation of the research proposals, the Green Finance Scientific Council makes the decision, which is composed of experts and individual members of the Monetary Council. Certain awards were awarded at the MNB's Green Finance Conference in November 2024.

The *Green Finance Science Grand Prize* was awarded to József Popp in 2024. Professor Popp is a lecturer at the John von Neumann University, a founding member of the Doctoral School of Economics and a corresponding member of the Hungarian Academy of Sciences. He is also a visiting professor at the WSB University in Poland and the University of Johannesburg. His research focuses on the green economy, circular economy, food safety, energy safety and environmental safety. His work is characterised by an interdisciplinary approach, and his publications are based on a complex methodological foundation. The Grand Prize is awarded to Hungarian researchers who have made significant scientific achievements in the field of green finance and whose publications have had a policy-shaping impact. The prize is awarded every three years; this was the second time since 2021.

The *Green Finance Science Talent Award* was awarded to Dániel Muth for his outstanding research achievements. Dániel Muth is an external researcher at the Institute of World Economics of the HUN-REN Centre for Economic and Regional Studies and a postdoctoral researcher at the Vrije Universiteit Amsterdam. His main research interests include the political economy of CO_2 pricing mechanisms, carbon taxation, emissions trading schemes and climate policy in the CEE region. His innovative approach and academic publications have contributed to the development of green finance. The prize is awarded to Hungarian researchers under 41 years of age with outstanding publication achievements.

The *Science Research Initiative for Green Finance* was open to applications also in 2024, by submitting a research plan. This was the 4th time for announcing the Research Initiative, and 4 research plans were awarded.

I. The first prize was awarded to Gábor Gyura and Paszkál Kiss for their research project on environmentally conscious pension savings. Their research aims to identify regulatory and development opportunities to

encourage sustainable pension savings. Gábor Gyura is an adjunct professor at the European University Institute, and Paszkál Kiss is an associate professor at the Károli Gáspár Reformed University.

II. Second place was awarded to the research team of András Bethlendi and Katalin Mérő. Their research focuses on the structural characteristics of the financial intermediary system and green finance in the CEE region. András Bethlendi is the Head of the Department of Finance at the Budapest University of Technology and Economics, and Katalin Mérő is an Associate Professor at the Department of Finance at the Budapest Business University.

III. The third place went to the research team led by Gábor Kutasi. Their research aims to analyse the use of fiscal and monetary policy instruments to promote green technologies. Other members of the research team include Vivien Czeczeli and Ádám Marton. The research team is composed of researchers from the National University of Public Service.

IV. The Special Prize was awarded to researchers Regina Bodó and Anett Zanócz. The topic of their research plan is the expected impact of the mandatory certification of compliance with the Corporate Sustainability Reporting Directive (CSRD) on the sustainability disclosure of large corporates. It aims to analyse the sustainability reporting and certification of large European corporates, which can help shape future regulations. Regina Bodó is a PhD student at the University of Szeged, Anett Zanócz is a PhD student at the Corvinus University of Budapest.

The winning research programmes all contribute to the development of sustainable finance and help to strengthen the theoretical and practical foundations of the green economy.

Box 10
The Governor's Committee on Sustainable Development (GCSD)

In line with the mission of the Hungarian Academy of Sciences (HAS) revised in 2019, the Governor's Committee on Sustainable Development (GCSD) considers one of its most important objectives to act as an advisor to the nation on environmental issues in the long term. The Committee takes a broad, interdisciplinary approach to sustainability, which is reflected in its composition. In addition to representatives from the natural and life sciences fields, it collaborates with recognised experts in various fields of social sciences (such as environmental law, sociology, economics and psychology) who are committed to the cause of sustainable development. Dr. Csaba Kandrács, Vice-Governor of the MNB, is also a member of the GSCD.

Key acronyms and abbreviations

BCRI – Bank Carbon Risk Index

COP16 – UN Biodiversity Conference

COP29 – UN Climate Change Conference

CPRS – Climate Policy Relevant Sectors

CSDDD – Corporate Sustainability Due Diligence Directive

CSRD – Corporate Sustainability Reporting Directive

CRAs – Credit Rating Agencies

CRD – Capital Requirements Directive

CRR – Capital Requirements Regulation

EBA – European Banking Authority

ESA – European Supervisory Authorities

EIOPA – European Insurance and Occupational Pensions Authority

ECB – European Central Bank

UN – United Nations

ESG – Environmental, Social and Governance

ESMA – European Securities and Markets Authority

FSB – Financial Stability Board

ISSB – International Sustainability Standards Board

ISIC – International Standard Industrial Classification

IMF – International Monetary Fund

MFAR – Mortgage Funding Adequacy Ratio

MiCA – Markets in Crypto-Assets Regulation

NFRD – Non-Financial Reporting Directive

NGFS – Network for Greening the Financial System

BGS – Bond Funding for Growth Scheme

OECD – Organisation for Economic Co-operation and Development

SFDR – Sustainable Finance Disclosures Regulation

TCFD – Task Force on Climate-related Financial Disclosures

UNEP FI – Finance Initiative of UN Environment Programme

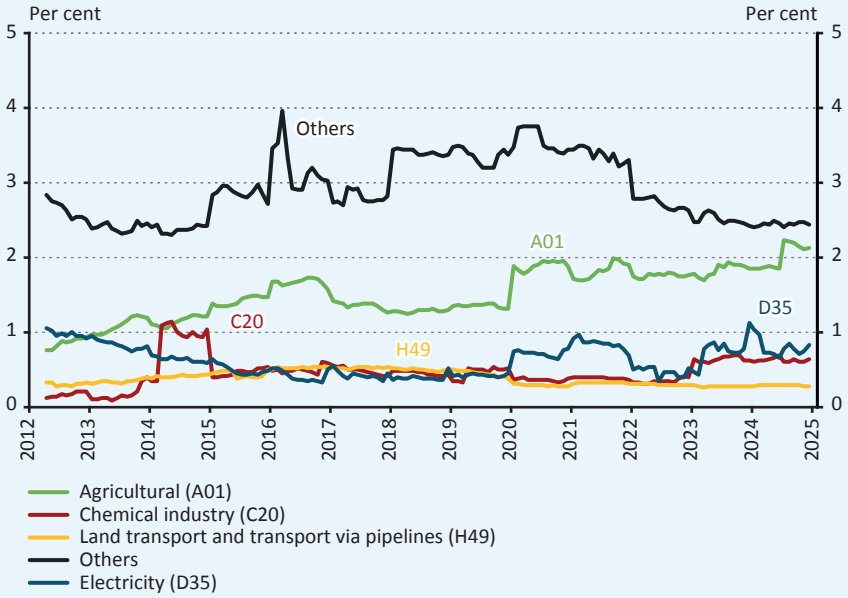
GHG – Greenhouse gas

ZKK – Zero Carbon Centre

GHP – Green Home Programme

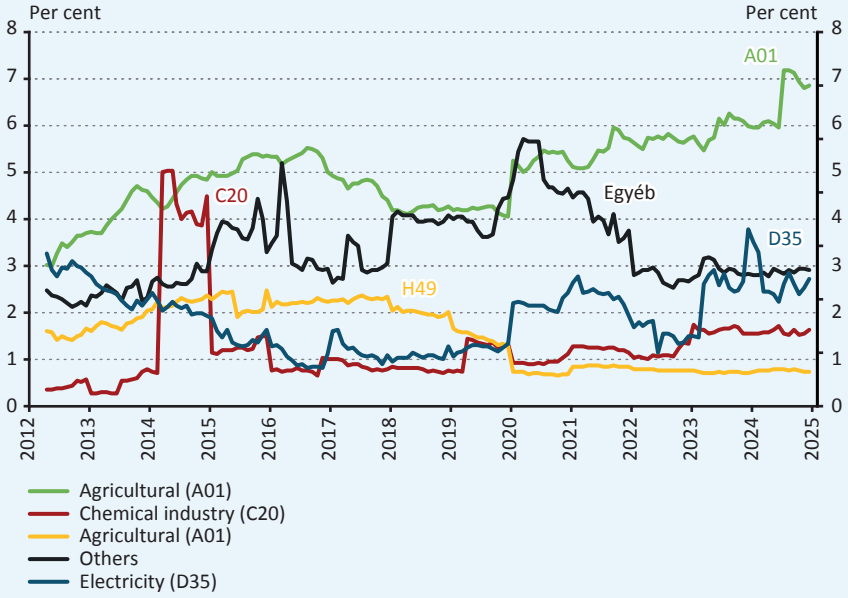
Appendix

Appendix 1
Monthly sectoral BCRI values (Linear weighting)



Source: MNB

Appendix 2
Monthly sectoral BCRI values (Gompertz weighting)



Source: MNB

Appendix 3
Impact of the Omnibus I proposal package (as known on 31 March 2025)

Accounting Directive	Requirements under the current Accounting Directive	Requirements according to the draft COM (2025) 80 Directive, which forms part of the Omnibus I proposal package
Companies required to prepare a Sustainability Report	Large corporates and SMEs of public interest, with the following parameters: more than 250 employees; and/or more than EUR 50 million sales revenue; and/or more than EUR 25 million total assets	Large corporates with the following parameters: more than 1,000 employees; and more than EUR 50 million sales revenue; or more than EUR 25 million total assets
Disclosure on the value chain	Total value chain	Required for companies that are not obliged to prepare a Sustainability Report, but only for the information included in their voluntary Sustainability Report
Assurance Opinion	At the first reporting: limited assurance, but in the long term: reasonable assurance	Limited assurance opinion is sufficient
Companies subject to the disclosure obligation under Article 8 of the Taxonomy Regulation	Companies required to prepare a Sustainability Report	Companies required to prepare a Sustainability Report, BUT with the following additional parameters: Opt-in disclosure requirement for large corporates with total employees of less than 1,000, or if they have over 1,000 employees but their annual net sales revenue is below EUR 450 million
CSRD	Current regulations	Draft COM (2025) 81 Directive, which forms part of the Omnibus I proposal package
Thresholds for Wave I	Large corporates of public interest, with the following parameters: more than 500 employees; and more than EUR 50 million sales revenue; and/or more than EUR 25 million total assets	Wave I is cancelled
Wave II and III companies	Wave II: Large corporates that are not Wave I companies Wave III: SMEs/large corporates of public interest, or small and non-complex institutions that qualify as SMEs of public interest, private insurance and reinsurance companies	Wave II: large corporates with more than 1,000 employees Wave III is cancelled
First disclosure requirement for Wave II and III companies	Wave II: 2026 (for the 2025 financial year) Wave III: 2027 (for the 2026 financial year)	Wave II: 2028 (for the 2027 financial year) Wave III: 2029 (for the 2028 financial year)

Mária Telkes – The Sun Queen

(1900 – 1995)

Little known in her native Hungary, she is called the ‘Sun Queen’ in the United States of America, where she spent most of her life. Perhaps her best-known patent is the first ‘solar house’ with a solar heating system.

Mária Telkes was born on 12 December 1900 in Budapest. His father was Aladár Telkes, a bank director. She was the eldest of eight siblings. After graduating in mathematics and physics, she worked as an assistant to Professor István Ribáry and obtained her PhD. In 1924, the family was visited by her uncle, Ernő Ludwig, who was the Hungarian consul in Cleveland. This encounter brought a turning point in the life of Mária Telkes, who moved to America at her uncle’s invitation. She began her career in 1925 in the research laboratory of the Cleveland Institute of Biophysics. At the institute, they studied the radiation of brain cells. Mária Telkes built an electric camera to measure the infrared radiation of brain cells.

In 1939 she moved to Boston, where she continued her career as a teacher and researcher at the Massachusetts Institute of Technology (MIT). She focused mainly on researching the potential of solar energy. She joined the Solar Energy Research Project with the design of the Dover Sun House funded by the American industrialist Godfrey Lowell Cabot. Six experimental solar houses were built with the 650,000 dollars donated by Cabot. Mária Telkes became the head of the research group in 1940. She is credited with the discovery of a chemical process to store solar energy.

Mária Telkes has filed several patents for the use of solar energy. Her most successful invention was a solar-powered seawater desalination system for the US military. The patent was followed by mass production: in the Second World War, every pilot was equipped with the life-saving device she had developed.

She also designed a solar-powered meat fryer, which became particularly popular in India, where the number of hours of sunshine is high. Again, the success of the invention was guaranteed by the simple operating principle and the low price of the device.

She published more than 100 scientific papers, had 39 patents linked to her name (the last one registered at the age of 90), and received 12 international awards (including that of the US Office of Scientific Research and Development). She also worked as a university lecturer and later as a consultant to large corporations, and was involved in several government-funded naval and space research programmes. Since the oil crisis of the 1970s, the importance of her solar energy research has only increased.

She returned to Hungary in 1995. She died in Budapest in the same year, aged 95. She received a posthumous award: Together with physicist Dennis Gabor, she was inducted into the National Inventors Hall of Fame in 2012.

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