Integrated Report on the Allocation and Environmental Impact of Hungary's Green Bond Proceeds 2024

December 2025

Foreword

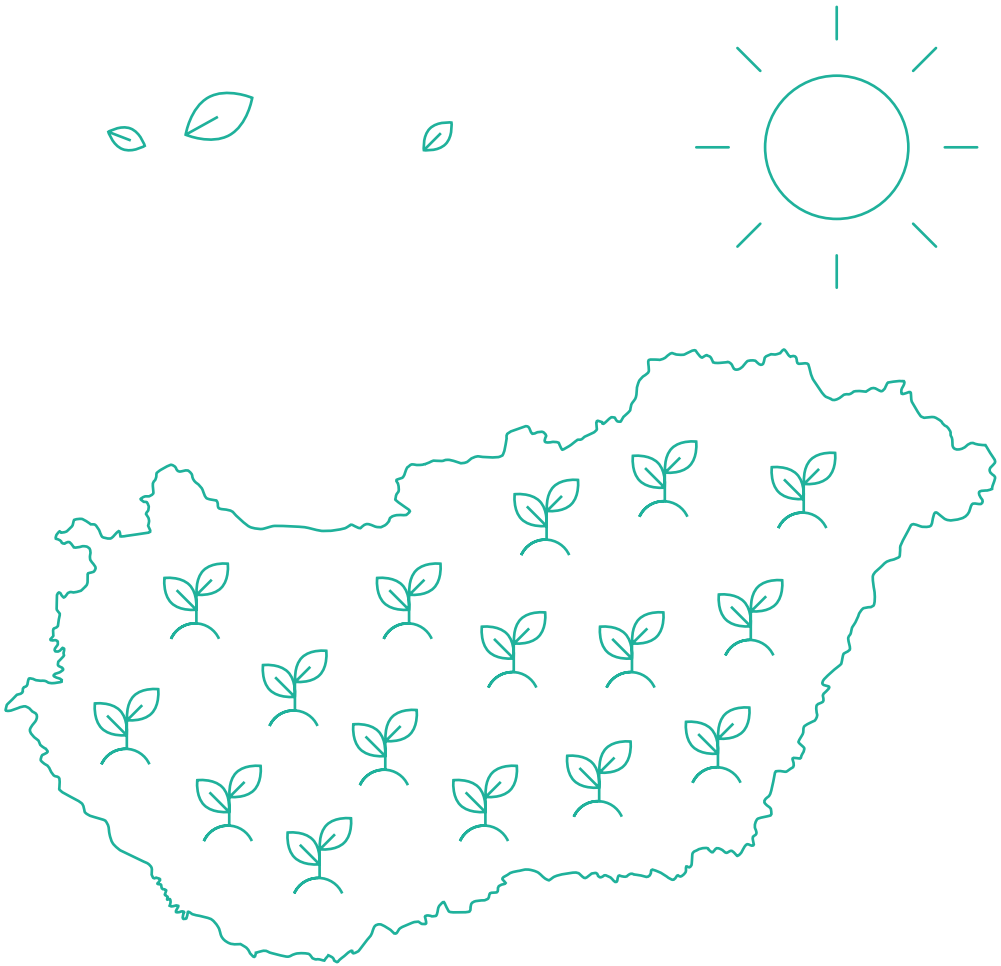
Dear Readers,

We are delighted to present the fourth Integrated Green Bond Report of Hungary ('Report') which covers the green bond issuances between 1 January 2024 - 31 December 2024. During this period, Hungary issued a EUR 1.5 billion 5-year green bond with a 4.00% coupon, a JPY 1.3 billion 10-year bond with a 2.35% coupon and reopened its HUF-denominated bonds (the 2032/G 4.50% maturing on 27 May 2032 and the 2051/G 4.00% maturing on 28 April 2051) multiple times. By the end of 2024, this resulted in EUR 6.6 billion of outstanding green debt, representing approximately 5% of the total debt. The green bond reports are essential tools in our communication with investors, providing high quality information and promoting transparency to track projects and their environmental impacts.

The Report was prepared in line with Hungary's Green Bond Framework (2023) to ensure that issuances and reopenings are in line with best market practices. In the Report, green bond proceeds refinanced projects from budget year 2022 and 2023. These projects fall within five green categories under the Framework, including Clean transportation, Land use & living natural resources, Pollution prevention & control, Climate Adaptation, and Sustainable water & wastewater management.

As a response to the developments in the sustainable finance market, Hungary has made a continuous and vigorous effort in strengthening its green bond reporting practice. Since 2024 (Integrated Green Bond Report 2023), eligible expenditures have been reassessed in each reporting period based on the EU Taxonomy's technical screening criteria, further enhancing the credibility and transparency of the allocated expenditures. For the first time, the Report also contains information on the project's social co-benefit, alongside with socio-economic effect. In addition, the methodologies for calculating the GHG impact have been refined to better reflect the environmental impact.

We would like to express our gratitude to all stakeholders involved in the preparation of the Report. We hope this report provides valuable insights to our Readers.



Mihály Hoffmann
Chairman & Chief Executive Officer
Government Debt Management Agency Private Company Limited by Shares

Kornél Kisgergely
President of Green Bond Steering Committee
Secretary of State for Budgetary Affairs
Ministry of National Economy

Content

EXECUTIVE SUMMARY 4

I. OVERVIEW OF THE REPORTING PRACTICE 9

I.1 Timeline 10

I.2 Recent developments, updates in the reporting practice 11

I.3 Hungary – Environmental, Social and Governance Profile 12

II. ALLOCATION OF THE GREEN BOND PROCEEDS 13

III. IMPACT OF THE FINANCED PROJECTS 18

III.1 Clean transportation 19
Case study 26

III.2 Land use & living natural resources 27
Case study 34

III.3 Pollution prevention & control 36
Case study 40

III.4 Climate adaptation 41
Case study 45

III.5 Sustainable water & wastewater management 47
Case study 49

IV. EU TAXONOMY ASSESSMENT 50
Case study 58

APPENDIX: IMPACT METHODOLOGIES 61

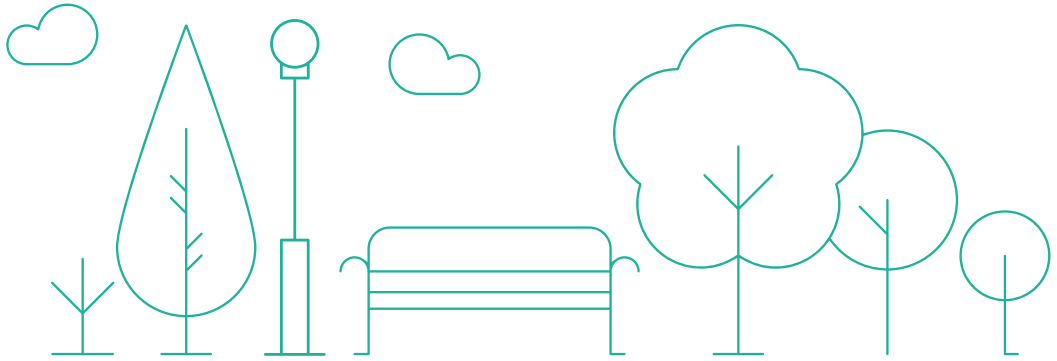
A.1 Electrification ratio for reimbursement of uncovered costs of railway passenger traffic and operation of the railway network 62

A.2 GHG emission avoidance in terms of modal shift to railway transportation 63

A.3 GHG emission avoidance in terms of modal shift for zero emission cars 64

A.4 GHG emission avoidance for urban public transport 65

A.5 Low-carbon GDP and employment effects 65



Executive Summary

Issuances and total proceeds

Proceeds from green bond issuances between 1 January 2024 - 31 December 2024, totalling HUF 673,076,055,827 are allocated in the Report (see Table 2, Figure 1 and *Section II*).

Allocation years

The proceeds are allocated to eligible green expenditures of budget years 2022 and 2023 (see *Section II*).

Selected eligible green expenditures

The selection of eligible green expenditures and the allocation of green bond proceeds was prepared by the Ministry of National Economy and the Government Debt Management Agency Pte. Ltd. (ÁKK). The selection follows the criteria set out in the Green Bond Framework (2023), while also applying ÁKK's stricter approach (see *Section I.2* and *Section II*).

EU Taxonomy

Projects included in the Report were assessed according to the EU Taxonomy technical screening criteria. The projects were mapped against 11 economic activities under four EU Taxonomy objectives: climate change mitigation (CCM), climate change adaptation (CCA), pollution prevention and control (PPC) and protection and restoration of biodiversity and ecosystems (BIO). According to the results 91.3% of the green bond proceeds are taxonomy-eligible, 5.7% are aligned and 83.9% are partially aligned with the EU Taxonomy (see *Section IV*).

Impact of investments

The assessment follows the recommendations of the ICMA Handbook - Harmonised Framework for Impact Reporting (June 2024 edition). The results are showcased on a project portfolio and, where feasible, on a project-by-project basis. Overall, the Report covers 90 indicators (24 core or other sector-specific ICMA indicators and 66 own indicators) for budget years 2022 and 2023, and, where possible, also for 2024 or lifetime. Besides the environmental impact, the report also showcases the total socio-economic effect and the social co-benefit of the relevant projects. Where feasible, impact achieved by the green bond is calculated on a pro-rata basis (see *Section III*).

UN Sustainable Development Goals

The Report maps the eligible green projects and their environmental impacts to the United Nation's Sustainable Development Goals (SDGs), taking into account ICMA's Green, Social and Sustainability Bonds: A High-Level Mapping to the Sustainable Development Goals document (see Figure 2).

Emission avoided and socio-economic effect

As a key result of the issuances covered by the Report, a total of 913 kilotons of CO_2eq GHG emission was avoided, HUF 502 billion low-carbon GDP was generated, and (at most) about 36 thousand persons were employed in low-carbon industries (see Table 1).

Green Bond Framework (version 2023)

The Report follows the Green Bond Framework (2023), ensuring alignment with international best market practices for the green bond issuance. The Framework was established in line with the ICMA Green Bond Principles 2021 (with June 2022 Appendix 1), considering the most recent market practices, in particular, the EU Taxonomy and the EU Green Bond Standard to the extent possible.

External Review

The Report is reviewed by Sustainalytics. The assessment is publicly available on ÁKK's website.

Total GHG emissions avoided

912,837 tCO_2eq

Total GHG emissions avoided per green bond investment

1,356 tCO_2eq/HUF bn

Low-carbon GDP effect

501.76 billion HUF

Low-carbon employment effect

35,614 persons (at most)

Table 1: GHG emission avoidance, GDP effects and employment effects associated with the allocation of green bonds issued between 1 January 2024 - 31 December 2024 (pro-rated impact). Notes: For methodological details, see Appendix: Impact methodologies.

Hungarian flag on the Hungarian Parliament Building

Selected eligible green expenditures in 2022 and 2023 amounted to:	**HUF 879.35 billion**
Green bond proceeds between 1 January 2024 – 31 December 2024, amounted to:	**HUF 673.08 billion**

Table 2: Eligible green expenditures and green bond proceeds raised - main figures.
Source: Ministry of National Economy, ÁKK

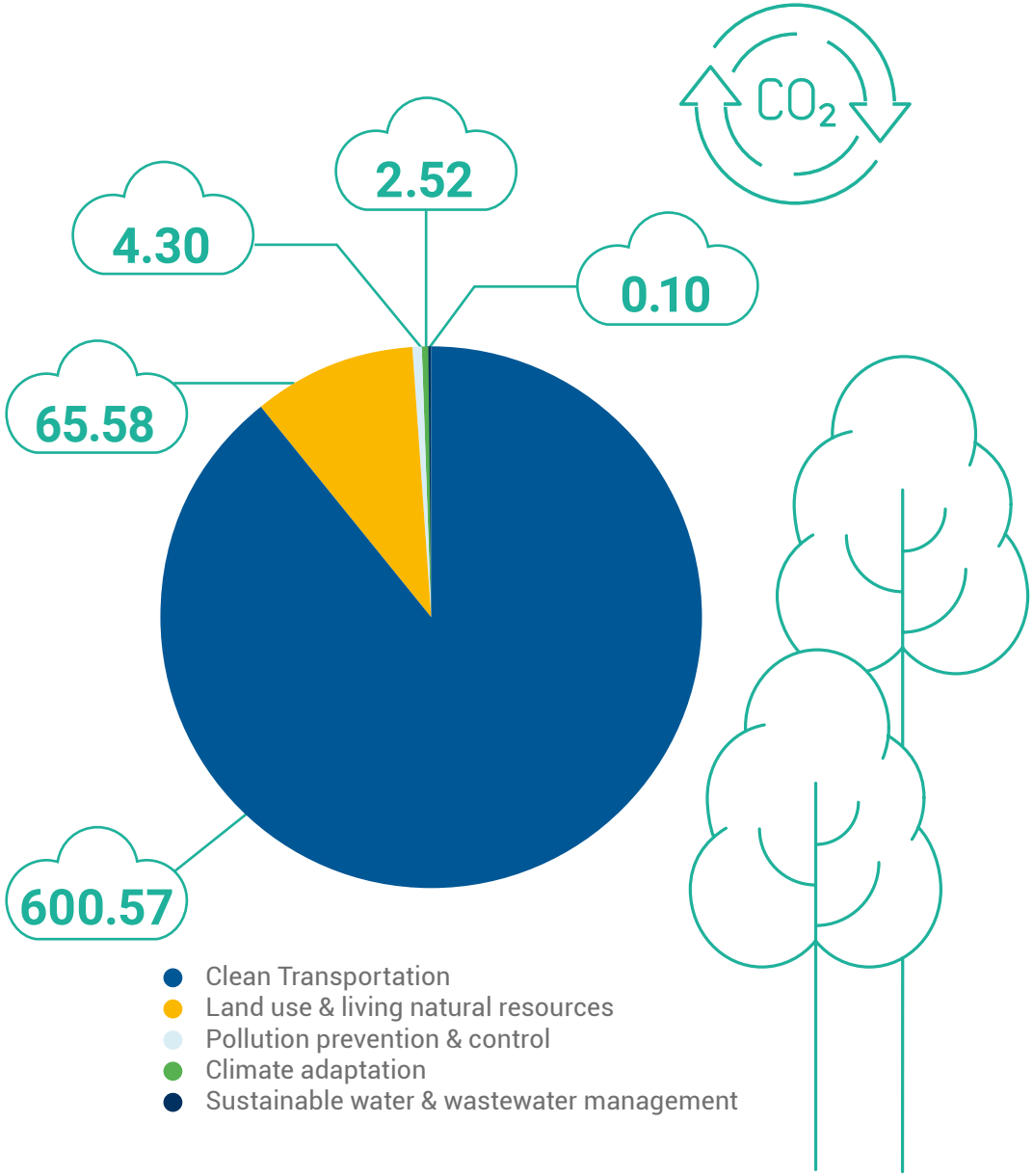


Figure 1: Allocation of the green bond proceeds (HUF billion). Source: Ministry of National Economy, ÁKK

Green categories	UN SDGs	EU Taxonomy activities	EU Taxonomy alignment (% of the allocated amount)
Clean transportation	11 SUSTAINABLE CITIES AND COMMUNITIES 13 CLIMATE ACTION	CCM 6.1 Passenger interurban rail transport CCM 6.5. Transport by motorbikes, passenger cars and light commercial vehicles CCM 6.14. Infrastructure for rail transport CCM 6.15. Infrastructure enabling low-carbon road transport and public transport	100% eligible 94.1% partially aligned 5.9% aligned
Land use & living natural resources	13 CLIMATE ACTION 15 LIFE ON LAND	CCM 1.3. Forest management CCM 1.4. Conservation forestry BIO 1.1. Conservation, including restoration, of habitats, ecosystems and species	11.6% eligible
Pollution prevention & control	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	PPC 2.4. Remediation of contaminated sites and areas CCM 5.9. Material recovery from non-hazardous waste	90% eligible
Climate adaptation	13 CLIMATE ACTION	CCA 9.1.Engineering activities and related technical consultancy dedicated to adaptation to climate change CCA 14.2 Flood risk prevention and protection infrastructure	97.7% eligible 97.3% aligned
Sustainable water & wastewater management	6 CLEAN WATER AND SANITATION		

Figure 2: UN SDG and EU Taxonomy alignment of the green categories between 2022-2023. Source: ÁKK and relevant Ministries

I. Overview of the reporting practice

Clean transportation	Land use & living natural resources	Pollution prevention & control	Climate adaptation	Sustainable water & wastewater

I.1 Timeline

Environmental Finance
Sustainable Debt Awards 2024
Winner
Impact report of the year (for issuers only)

First issuance of green bonds in Euro (June 2020) and in Yen (September 2020)

Green Bond Framework (May 2020, SPO)

Inaugural Green Bond Allocation Report 2020 (March 2021, External Review [ER])

Inaugural Green Bond Impact Report 2020 (November 2021)

First Issuance of green bonds in Forint (April 2021) and in Yuan (December 2021)

Green Bond Framework (2023) (July 2023, SPO)

Inaugural Integrated Green Bond Report 2021 (December 2022, ER)

Integrated Green Bond Report 2022 (December 2023, ER)

Integrated Green Bond Report 2023 (December 2024, ER)

Integrated Green Bond Report 2024 (December 2025, ER)

I.2 Recent developments, updates in the reporting practice

Hungary aims to be a frontrunner on green bond market with strong focus on transparency and reporting. The Hungarian Government Debt Management Agency (ÁKK) continuously develops the green bond reporting practice in line with the newest international guidelines, best market practices and investor feedback.[1] In the Green Bond Framework (2023), a key improvement under the Clean transportation category was the commitment to finance only electrified railway network.

Commitments in the reporting beyond the Green Bond Framework (2023)

- **Selected eligible green expenditures:** Although certain projects would be eligible for financing under the Green Bond Framework (2023), in line with the best market practices and investor feedback, Hungary applies a stricter methodology for the allocation and excludes specific expenditures, e.g. hybrid vehicles, tram-trains, projects focusing solely on animal genetic conservation or projects with negligible impact.

- **EU Taxonomy assessment:** Since 2024 (Integrated Green Bond Report 2023), Hungary prepares an EU Taxonomy assessment for each green bond report, reassessing the available eligible expenditures based on the technical screening criteria. While the Green Bond Framework (2023) takes into account the Climate Delegated Act, the taxonomy assessment prepared for the green bond report considers the Climate Delegated Act, the Delegated Act amending the Climate Delegated Act and the Environmental Delegated Act.

- **Socio-economic impact:** Projects refinanced by the green bonds also have an impact on the economic development and social conditions in Hungary. ÁKK has developed its own approach to show how much lower GDP and employment in low-carbon industries would be without these expenditures, i.e. how much higher GDP and employment are in these industries as a result of an economy-wide multiplier process.

- **Social co-benefit:** Since certain projects have strong social aspects as well — for example, accessibility is important in the case of clean transportation — Hungary has started to report on the social co-benefits of the relevant projects.

- **Pro-rated impact:** Where applicable, impact is indicated on a pro-rata basis in the report (indicated with) to showcase the results achieved exclusively by the green bond.

- **Life-cycle impact:** Impact of certain projects can occur during their entire lifetime. Where possible, Hungary discloses (indicated with) the accumulated impact over the lifespan of the financed projects.

Other related developments

- **Green budgeting[2,3]:** Under Government Decision 1023/2025. (II. 18.), the Ministry of National Economy is mandated to conduct a pilot on the environmental and climate-friendly aspects of the central budget expenditures for the 2026 budget year. Starting from the 2027 budget year, Hungary will develop and continuously improve the green budgeting methodology with the involvement of the relevant ministers, taking into account the relevant recommendations of the European Union and the experience gained from the pilot project.

- **Hungary - Environmental, Social and Governance Profile[4]:** ÁKK (with a collaboration of the relevant stakeholders) has prepared and published the Hungary's ESG profile document in 2024, which offers a comprehensive overview of Hungary's ESG approach, including challenges, objectives, key actions and progress towards a sustainable future. The profile was updated and significantly extended in 2025. It aims to serve as an essential tool in the communication with investors.

[1]For an international comparison, see Lukács B.: Sovereign green bond reporting practices in the EU: A harmonised or fragmented landscape? (Forthcoming)

[2]Draft Budget Bill on the 2026 central budget of Hungary Chapter Justification Volume 2, page 459: https://www.parlament.hu/irom42/11864/11864KIEGSZ003.pdf

[3]Lukács B., Bebes A. (2025): ESG budgeting and the next generation of sustainable bonds. *In: Risks and Challenges for Public Debt Management: Inflation, Markets and Climate.* Proceedings of the 3rd Public Debt Management Conference, Washington, D.C., October 3-4, 2024. https://www.publicdebtnet.org/export/sites/pdm/pdm/.content/attachments/pdm-proceedings-code.pdf

[4]https://www.akk.hu/download?path=5416831e-5ce8-4da4-aec6-c1772008a272.pdf

I.3 Hungary – Environmental, Social and Governance Profile

In 2024, based on investor feedback, ÁKK has published the Hungary – Environmental, Social and Governance Profile (Hungary's ESG profile), which was updated and expanded in 2025.[5] The document was created on a best effort basis, predominantly building on the latest available public data. The profile contains more than 30 strategies and action plans, 20 Hungarian ESG-relevant regulations, 40 environmental and social indicators, 40 programmes, calls or thematic events. It complements the Green Bond Framework (2023) and green bond reports by offering relevant national and sectoral data (see Table 3).

Structure and content of the profile:

- **Key ESG facts:** progress on sustainable development goals, sustainable development policy, Hungary's National Framework Strategy on Sustainable Development, ESG legal harmonisation between EU and Hungary, Hungary's RRP, operative programmes under the EU Cohesion Policy and Common Agriculture Policy.
- **Hungary's environmental objectives and achievements:** climate (mitigation and adaption), energy, biodiversity and sustainable water management;
- **Hungary's pathway to climate neutrality:** sectoral GHG emission, overview of the transport, building, energy, industry, waste, agriculture and LULUC sector;
- **Green finance in Hungary:** institutional overview, Green Bond Framework (2020) achievements, Green Bond Framework (2023), case studies related to projects refinanced by green bonds;
- **Hungary's social and governance objectives, achievements:** support for families and elders, sustainability considerations in education, development of cities and countryside, employment generation, equality in employment, job seeking support for specific target groups, physical and mental health promotion and disease prevention etc.

[5] https://akk.hu/content/pat0h=hungary-esg-profile-en

Green Bond Framework (2023) Eligible Green Category	Hungary – Environmental, Social and Governance Profile	
	Main section	Other related information
Clean transportation	Page 31, 32, 33	Page 8, 10, 11, 13, 19, 20
Land use & living natural resources	Page 23, 24, 25, 40	Page 6, 8, 9, 11
Pollution prevention & control	Page 15, 16, 17, 39	Page 6, 8, 9, 13, 29
Climate adaptation	Page 15, 16, 17	Page 8
Sustainable water & wastewater management	Page 27, 28, 29	Page 6, 8, 9, 10, 13,
Renewable Energy	Page 19, 20, 21, 31, 32, 33, 34, 35, 36, 37, 38	Page 6, 8, 10, 11, 13
Energy Efficiency (incl. Green Buildings)		
Research, innovation & awareness raising	-	Page 8, 20, 21, 24, 25, 29, 35

Table 3: Connection between the Green Bond Framework (2023) and Hungary's ESG profile

II. Allocation of the green bond proceeds

Eligible green expenditures can fall under four expenditure types according to the Green Bond Framework (2023):

- investment (capital) expenditures: expenses of goods and services for future use. For example, public money spent on railway electrification;
- intervention expenditures: refers to the active role of the government in implementing policies in the economy. For example, supporting or funding organisations performing important political tasks for the public. These can be financing NGOs working for environmental protection, nature conservation indemnification, or forest area development and improvement of the viability of forests, etc.;
- tax expenditures: government revenue losses from tax exclusions, exemptions, deductions, credits, deferrals, and preferential tax rates;
- operating expenditures: refers to expenses incurred to day-to-day operations of the government. Pay for the costs of running the services, such as salaries, equipment, utilities, etc.

Budget expenditures that already receive dedicated funding (e.g. EU funding, proceeds from the sale of EU ETS allowances, a dedicated tax, or EIB and/or other supranational entities' loans) are excluded to avoid double counting. The allocation is determined by the proceeds from the bonds minus bond redemptions (at market price).[6] The Ministry of National Economy along with the other relevant ministries are responsible for regularly reviewing the expenditures and the relevance of the associated information. In the allocation process, the Ministry of National Economy[7] recommends a list of projects, which are reviewed and verified on project level to ensure that each budget line complies with the green eligibility criteria defined in the Green Bond Framework (2023). ÁKK further narrows this eligible pool to a selected eligible pool. Expenditures linked to nuclear power, the armament and defence sector, fossil fuel production and related power generation are by default excluded.

In accordance with the Green Bond Framework (2023) the green bond allocation methodology follows the Green Bond Principles version 2021 (with June 2022 Appendix 1) published by the ICMA. In addition, the methodology considers the EU Taxonomy Regulation and the Delegated Acts.

Summary of the allocation methodology:

- ÁKK applies a stricter allocation methodology than the Green Bond Framework (2023) would allow and limits the allocation to a subset of eligible green expenditures, referred to as selected eligible green expenditures. Specific expenditures, such as hybrid vehicles, tram-trains, projects focusing solely on animal genetic conservation or projects with negligible impact are excluded.
- Selected eligible green expenditures amounted to HUF 353.24 bn for 2022 (excluding previously allocated proceeds) and HUF 526.11 bn for 2023. The eligible green expenditures were determined based on data provided by the Ministry of National Economy, adjusted and reviewed according to the information provided by the responsible ministries and beneficiaries of the projects. The selected eligible green expenditures have sufficient amount of impact information available and are prioritised to be eligible to the EU Taxonomy; moreover, where possible, they also fulfil or partially fulfil the 'substantial' contribution and 'do no significant harm' criteria. Expenditures that have a favourable effect on the environment but are not covered by the EU Taxonomy are also included (e.g.: organic farming, agri-environmental payments).

[6]The principles of managing redemptions of green bonds:
- It is not allowed to deduct redemptions from proceeds that are already allocated;
- The allocable value (i.e. unallocated proceeds from prior issuances and current issuances) minus redemptions cannot be less than 0.

[7]Previously the Ministry of Finance was responsible for the review of the expenditures. Since 1 January 2025, it has merged into the Ministry of National Economy.

- Green bond proceeds from issuances between 1 January 2024 – 31 December 2024 covered 76.54% (HUF 673.08 bn) of the selected projects (HUF 879.35 bn) in the 2022 and 2023 budget years.
- The selected expenditures were fully covered for 2022 and proportioned according to the ratio for allocation (60.79%) for 2023 (see Figure 3).
- Details of the selected eligible expenditures and the allocation of green bond proceeds are in Table 4, Table 5, Table 6, Table 7.
- Details of the EU Taxonomy eligibility and alignment are in Figure 4.

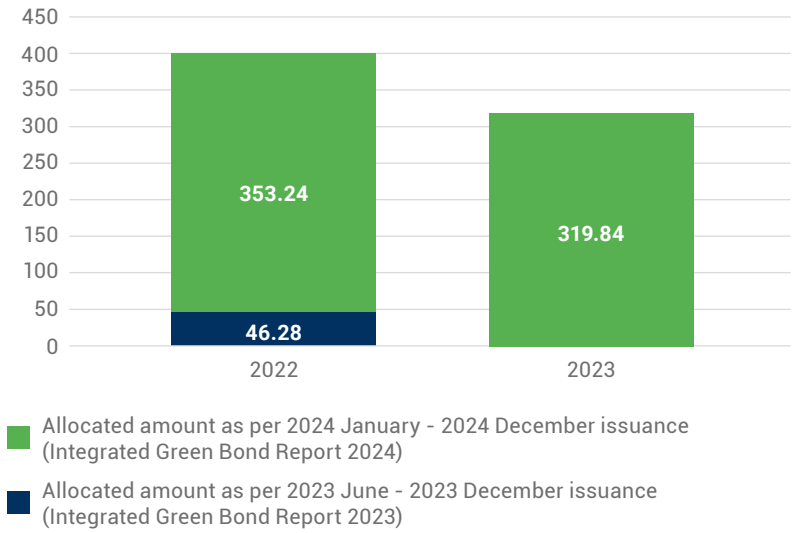


Figure 3: Allocation of the issuances under the Green Bond Framework (2023) (HUF bn). Source: ÁKK

Market	ISIN	Issue date	Maturity date	Maturity (years)	Face amount (billion)[8]	Proceeds received[9]	Swap to EUR (billion)	FX rate to HUF[10]	Total Green Bond Proceeds (billion HUF)
HUF	HU0000404991	28/04/2021[11]	28/04/2051	30	HUF 18.49	HUF 12.37	-	-	12.37
HUF	HU0000405535	26/01/2022[12]	27/05/2032	10	HUF 96.44	HUF 87.36	-	-	87.36
EUR	XS2753429047	25/01/2024	25/07/2029	5	EUR 1.50	EUR 1.48	-	385.08	570.10
JPY	JP534800BQ98	12/09/2024	12/09/2034	10	JPY 1.30	JPY 1.30	EUR 0.008[13]	396.48	3.25

Table 4: Details of the allocated green bond proceeds. Source: ÁKK, Notes: According to ÁKK's strategy, all non-euro bonds must be converted into euro liabilities through swap transactions. The purpose of the green swap transaction is to hedge the currency risk of a specific Green Bond. Accordingly, JPY 1.30 billion was swapped for EUR 0.008 billion resulting in HUF 3.25 billion green bond proceeds (the maturity of the swap and the green bond is identical).

[8]The redemptions of outstanding bonds prior to maturity are deducted.
[9]Proceeds received at issuance, at market price.
[10]T-1 exchange rate of Magyar Nemzeti Bank (the central bank of Hungary).
[11]Date of first issuance. As for this report, there were 4 auctions (reopenings) between 2024 January-December: on 09/05/2024, 24/10/2024.
[12]Date of first issuance. As for this report, there were 4 auctions (reopenings) between 2024 January-December: on 14/03/2024, 06/06/2024, 29/08/2024, 21/11/2024.
[13]JPY-EUR cross-currency swap agreement: the value date of the swap transaction was 13/09/2024.

ISIN code	Total Green Bond Proceeds (billion HUF)	Clean transportation (billion HUF)	Land use & living natural resources (billion HUF)	Pollution prevention & control (billion HUF)	Climate adaptation (billion HUF)	Sustainable water & wastewater manage-ment (billion HUF)
HU0000404991	12.37	11.04	1.21	0.08	0.05	0.002
HU0000405535	87.36	77.95	8.51	0.56	0.33	0.01
XS2753429047	570.10	508.69	55.54	3.64	2.14	0.09
JP534800BQ98	3.25	2.90	0.32	0.02	0.01	0.0005

Table 5: Breakdown of the allocation of green bond proceeds by issuance. Source: ÁKK

Eligible Green Category	Selected eligible green expenditures (HUF bn)	Allocation of green bond proceeds for the selected eligible expenditures (HUF bn)
Clean transportation	774.07	600.57
Land use & living natural resources	97.15	65.58
Pollution prevention & control	5.02	4.30
Climate adaptation	2.99	2.52
Sustainable water & wastewater management	0.11	0.10
TOTAL	**879.35**	**673.08**

Table 6: Selected eligible green expenditures and the allocation for 2022 and 2023. Source: Ministry of National Economy, ÁKK

Eligible Green Category	Selected eligible green expenditures (HUF bn)			Allocation of green bond proceeds for the selected eligible expenditures (HUF bn)		
	2022	2023	TOTAL	2022	2023	TOTAL
Clean transportation	331.55	442.52	774.07	331.55	269.02	600.57
Land use & living natural resources	16.62	80.53	97.15	16.62	48.96	65.58
Pollution prevention & control	3.18	1.84	5.02	3.18	1.12	4.30
Climate adaptation	1.80	1.19	2.99	1.80	0.73	2.52
Sustainable water & wastewater management	0.09	0.03	0.11	0.09	0.02	0.10
TOTAL	**353.24**	**526.11**	**879.35**	**353.24**	**319.84**	**673.08**

Table 7: Selected eligible green expenditures and the allocation for 2022 and 2023. Source: Ministry of National Economy, ÁKK

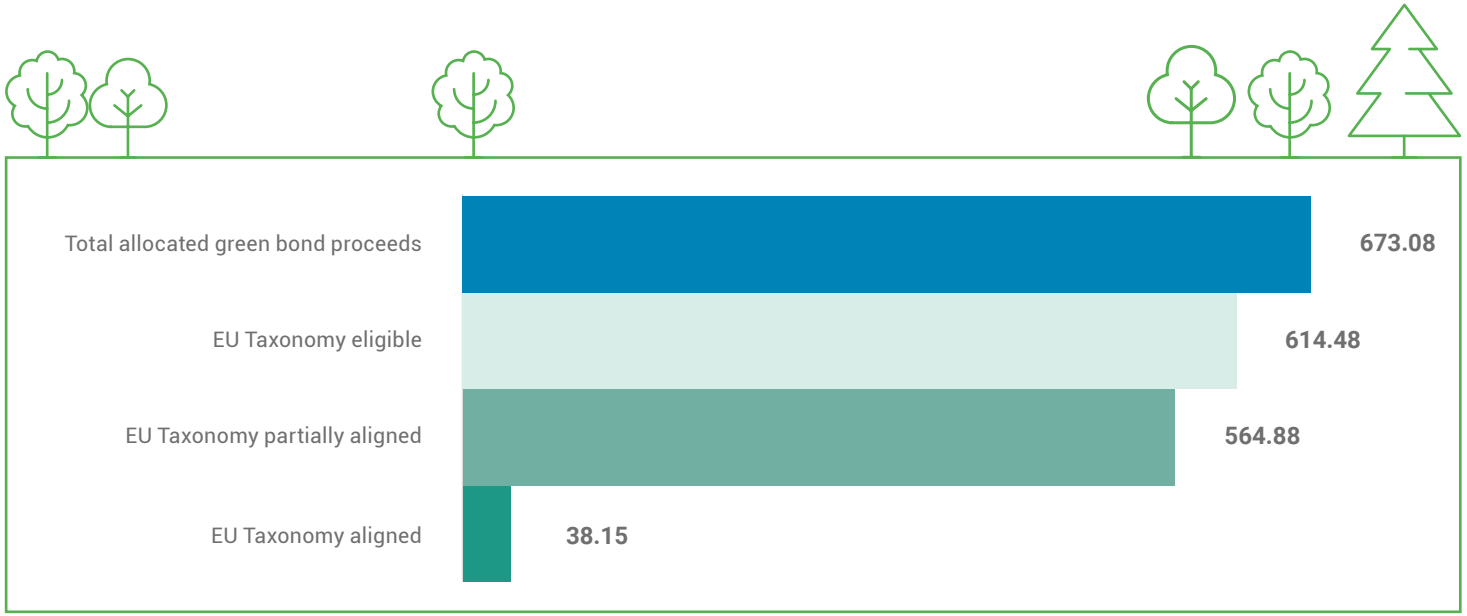
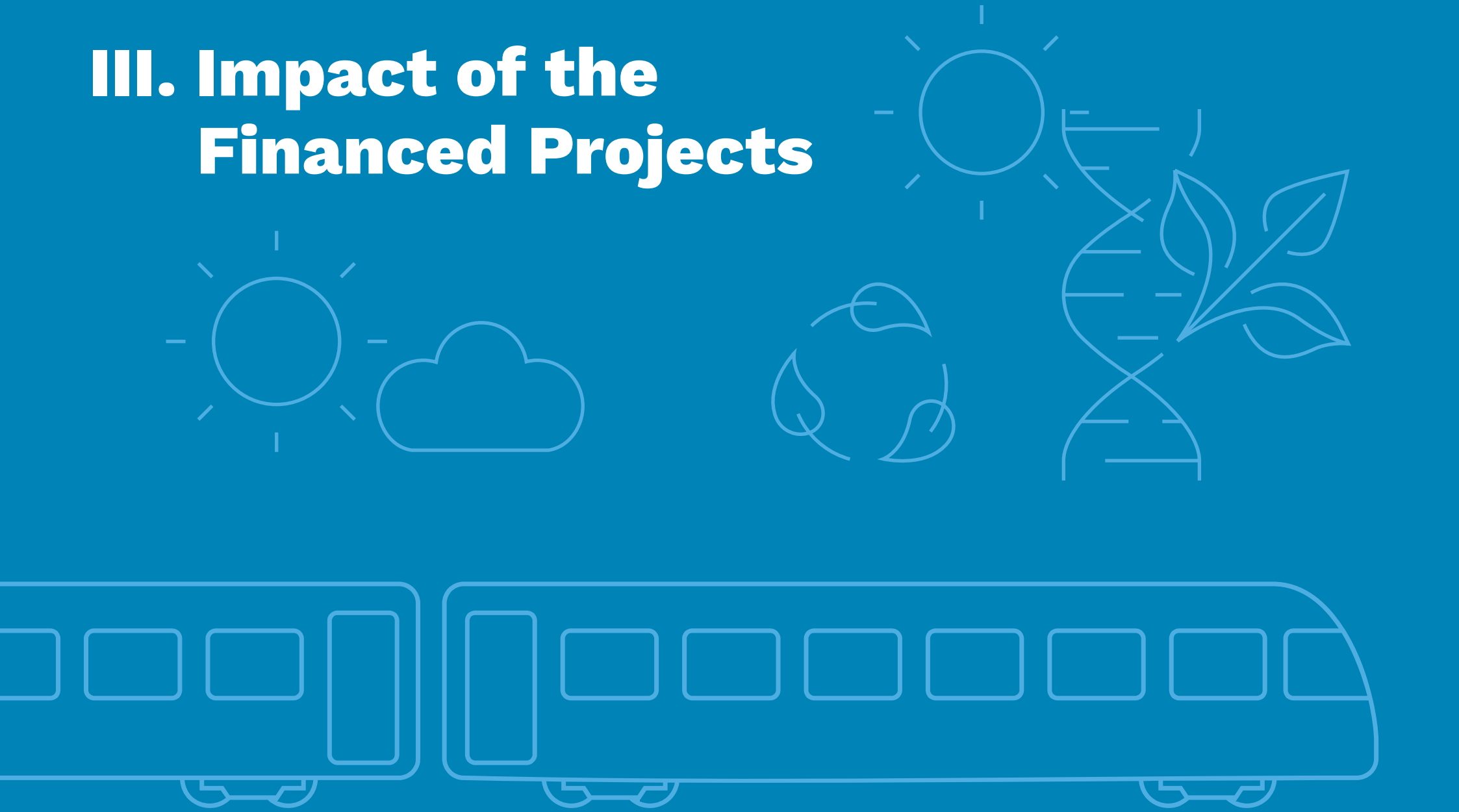


Figure 4: EU Taxonomy eligibility and alignment of allocated green bond proceeds (HUF bn) (for definitions and further details, see Section IV). Source: ÁKK

III. Impact of the Financed Projects



III.1 Clean transportation

Clean transportation is the largest category within the eligible green expenditures. All expenditures in this category are partially aligned or aligned with the EU Taxonomy. Proceeds from the green bond issuances were allocated to projects related to electrified railway network, as well as urban (metro) and road (cars with zero tailpipe emission) transport.

The main goal of Clean transportation expenditures is to attract more people to use environmentally friendly transportation through modernisation and efficiency improvements, thereby contributing to greater GHG emissions avoidance.

For the assessment of GHG emission avoidance, the electrification of railway infrastructure and electrified railway passenger transport were assessed separately.

Total allocated amount (HUF bn)	% of total green bond proceeds
600.57	89.23%

Number of KPIs: 21
Pro-rated impact
Life-cycle impact

11 SUSTAINABLE CITIES AND COMMUNITIES

13 CLIMATE ACTION

III.1.1 Reimbursement of uncovered costs of railway passenger traffic

In line with the EU regulation on minimum service, this main programme scheme refinances the costs of electrified railway passenger transport that are not covered by direct revenues.[14] In Hungary, passenger railway transport is managed by two railway operators: GYSEV, which mostly operates in Western-Hungary and MÁV Passenger Transport Co (part of MÁV-Group), which provides rail passenger transport services all across Hungary. Both railway companies have started implementing several measures to promote sustainability. For example, GYSEV has implemented a sustainability policy[15], and operates a website for green transportation[16], meanwhile MÁV-Group has published the Strategic Sustainability Objectives document[17].

The allocation and impact are in Table 8 and Table 9. For methodological details, see *Appendix A.1* and *A.2*.

This programme scheme is fully financed by the state budget.

Social co-benefit

County and Country passes were introduced in 2023, allowing passengers to travel at a discounted price within the geographical area covered by each pass.[18] With the Country pass ("Hungary Pass"), passengers can travel anywhere in the country (including the capital, Budapest) without having to purchase local passes. Hungary has 19 counties, all of which have their own County pass. Besides the County and Country passes, railway transport is free or available at a discount price for several target groups, including students, pensioners, people with disabilities, refugees etc.[19]

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Intervention	229.23	153.24

Table 8: Allocation

Impact indicators	2022	2023
GHG emissions avoided by electrified railway transport (tCO_2eq) (aggregated for III.1.1 - III.1.4)	440,833	375,217
Passenger-kilometres on electrified railway line (thousand pkm)	6,774,467	9,031,338[20]
Country and county passes purchased (pcs)	-	4,074,517
Passengers on electrified railway lines (persons)	125,383,194	170,414,647

Table 9: Impact. Source: MÁV, GYSEV

[14] Rail Passenger Rights Regulation (EU) 2021/782, which provides a minimum level of service to passengers.
[15] https://www2.gysev.hu/sites/default/files/media/documents/fenntarthatosagi_esg_politika_gysev_alairassal_0.pdf
[16] https://www2.gysev.hu/ugyfelszolgalat/zold-kozlekedes
[17] https://www.zoldkozossegikozlekedes.hu/sites/default/files/2021-04/mav-volan-csoport_fenntarthatosagi_kiadvany.pdf
[18] https://www.ujtarifa.hu/en
[19] https://www.mavcsoport.hu/mav-szemelyszallitas/belfoldi-utazas/kedvezmenyek

[20] Passenger-kilometres for 2023 includes the estimated traffic of passengers using Country and County passes (approximately 34% of total passenger-kilometres).

III.1.2 Reimbursement of the operation of railway network

This main programme scheme refinances the costs related to the reimbursement of the operation of electrified railway network operated by GYSEV and MÁV Infrastructure Co. Ltd. (part of MÁV-Group), such as buying auxiliary devices and other devices to enhance the comfort of wagons, operating expenses like procurement of special services, and the personnel costs of railway infrastructure companies.

As of 2023, 45.5% of the operated railway network was electrified, which is expected to further increase in the future years.[21] However, rail passenger traffic is predominantly powered by electric traction, as more than 90% of passenger-kilometres are related to electrified traction lines according to the railway network operators.

The allocation and impact are in Table 10 and Table 11. For methodological details, see *Appendix A.1.*

This programme scheme is fully financed by the state budget.

Electric locomotive

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Operating	83.92	102.37

Table 10: Allocation

Impact indicators	2022	2023
GHG emissions avoided by electrified railway transport (tCO_2eq) (aggregated for III.1.1 - III.1.4)	440,833	375,217
Length of electrified railways (km)[21]	3,221	3,368

Table 11: Impact. Source: MÁV, GYSEV, Hungarian Central Statistical Office

Electrified railway

[21] https://www.ksh.hu/stadat_files/sza/en/sza0030.html

III.1.3 Modernisation of rail transport

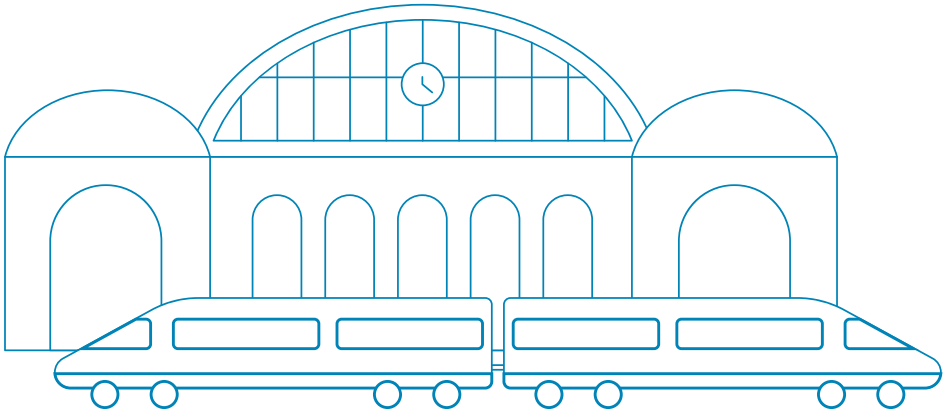
The objective of the rail modernisation projects is to promote safe and efficient operation of the railway transport system and to upgrade the quality of services to improve customer experience.

This main programme scheme supported projects related to ETCS2 development on railway lines Bajánsenye–Boba, Sopron–Szombathely–Szentgotthárd, the upgrade of bridge infrastructure, railway crossings, railway lines and stations on railway lines Kaposvár–Fonyód, Budapest Kelenföld–Székesfehérvár, and the traffic safety programme.

The allocation and impact are presented in Table 12 and Table 13.

For more information, see *Case study*.

Social co-benefit
Several stations and platforms received accessibility updates, bike storages and P+R car parks were built.



Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Capital	0.45	0.71

Table 12: Allocation

Impact indicators	2022	2023	2024
GHG emissions avoided by electrified railway transport (tCO_2eq) (aggregated for III.1.1 - III.1.4)	440,833	375,217	-
Length of railway lines affected by railway safety improvements (km)	117.4	-	-
Number of renovated railway crossings (pcs)	2	-	-
Number of renovated bridges (pcs)	1	-	-
Total bike storage capacity of renovated railway station(s) (No. of bikes)	-	100	-
Total P + R capacity (No. of vehicles)	-	152	-
Number of passengers daily on the affected railway lines (persons)[22]	-	7,382	3,596

Table 13: Impact. Source: MÁV, GYSEV

[22] Since May 2023, Country and County passes are available. As these products are not route-specific, they do not include a departure or destination station, and therefore cannot be assigned to a particular railway line or station.

III.1.4 Electrification of railway lines

The electrification of railway lines is a key pillar for a transition to a low carbon railway transportation. Rail transportation accounts for a smaller amount of air pollution than road transportation. To this end, electrification process is needed to eliminate emissions and particulates. Moreover, electrified rail lines may increase the speed of rail transportation, thereby further reducing environmental load and GHG emissions. Additionally, reduced travel times can help to attract new passengers.

Allocation under this main programme scheme refinanced the electrification and additional construction works of Budapest–Esztergom railway line, bottleneck elimination and electrification of railway line Szabadbattyán–Balatonfüred, and traction power supply development.

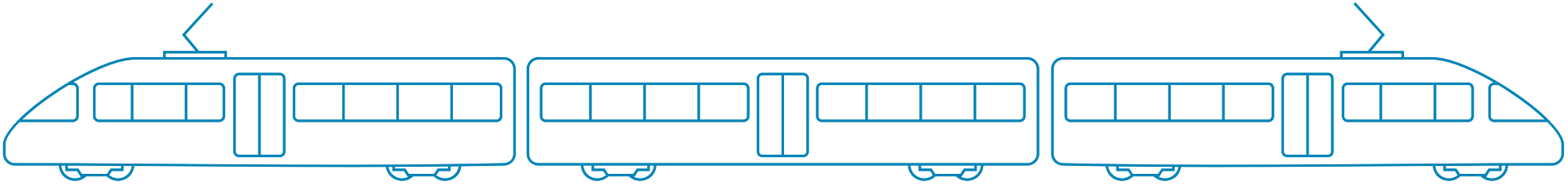
The allocation and impact are presented in Table 14 and Table 15.

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Capital	0.38	0.09

Table 14: Allocation

Impact indicators	2022	2023	2024
GHG emissions avoided by electrified railway transport (tCO_2eq) (aggregated for III.1.1 - III.1.4)	440,833	375,217	-
Number of passengers daily on the affected railway lines (persons)[23]	-	11,591	4,714

Table 15: Impact. Source: MÁV



[23] Since May 2023, Country and County passes are available. As these products are not route-specific, they do not include a departure or destination station, and therefore cannot be assigned to a particular railway line or station.

III.1.5 Modernisation of urban public transport

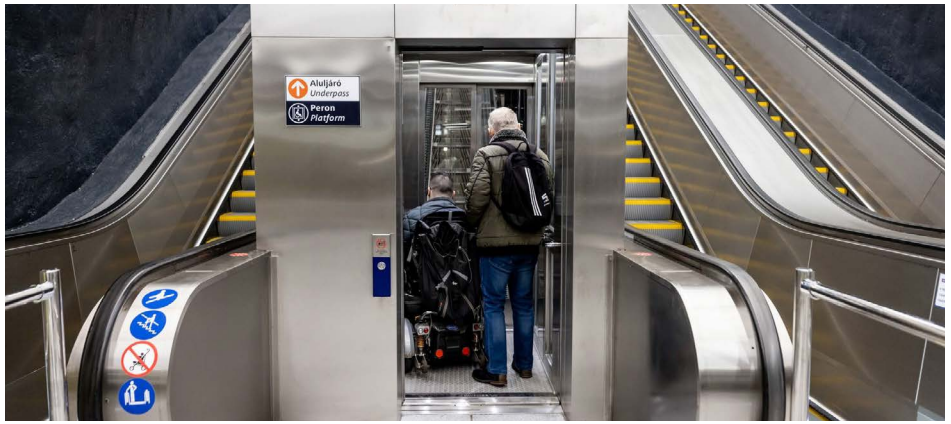
This main programme scheme includes initiatives to promote environmentally friendly public transportation, which plays an important role in reducing GHG emissions of the local transportation.

Under this programme scheme, the upgrade of metro line M3 in Budapest was refinanced in order to increase the service and comfort level of public transport and to encourage the modal shift to environmentally friendly transport modes. The expected lifetime of the renovation is 30 years, including the construction period. The renovation was completed in 2023 - metro line M3 began operating on the entire line in mid-2023.

The allocation and impact (including life-cycle) are in Table 16 and Table 17. For methodological details, see *Appendix A.4*.

Social co-benefit

During the renovation, 18 out of metro line M3's 20 stations were upgraded to include wheelchair accessible infrastructure. With these upgrades, 19 out of 20 stations are fully wheelchair accessible from the ground level, and 1 is partially accessible (there is full wheelchair access from the underpass to the platforms).



Accessible M3 metro station

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Capital	11.69	6.35

Table 16: Allocation

Impact indicators	2022	2023	2024
Length of renovated metro line (km)	-	17.3	-
Daily passenger count (persons)[24]	-	363,396	363,396
Number of stops that received wheelchair accessible infrastructure updates (pcs)	11	7	-
Number of wheelchair accessible elevators installed (pcs)	-	40	-
Total GHG emissions avoided due to the project (tCO_2eq)	-	8,455 402,162	16,909 402,162
GHG emissions avoided due to green bond proceeds (tCO_2eq)	-	696 33,121	1,393 33,121

Table 17: Impact. Source: BKV

[24]The estimation was based on the data measured after the completion of the renovation.

III.1.6 Tax exemptions of zero emission vehicles

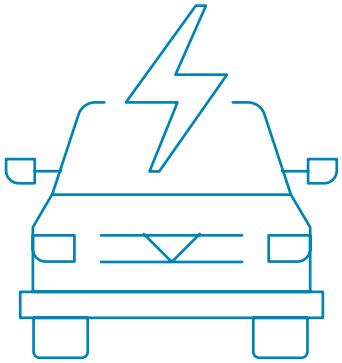
This programme scheme includes tax exemptions for registration tax, motor vehicle tax, company car tax and motor vehicle duty introduced in the Jedlik Ányos Plan to lower the cost of environmental-friendly vehicles.

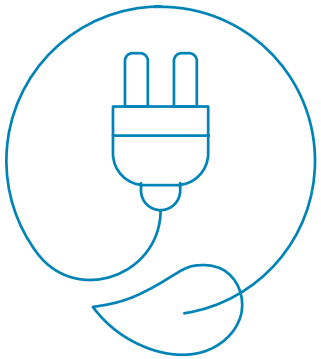
In this main programme scheme, only vehicles with zero-tailpipe emissions, more specifically, electric (5E) and other zero-emission (5Z) vehicles were refinanced by the green bond proceeds (i.e. hybrid vehicles were not refinanced).

Similar to other European countries, passenger transportation in Hungary is predominantly done via passenger cars; however, Hungary has the highest share of public transportation in the EU.[25]

This programme scheme is fully financed by the state budget.

The allocation and impact are in Table 18 and Table 19. For methodological details, see *Appendix A.3*.





[25] https://ec.europa.eu/eurostat/databrowser/view/tran_hv_psmod/default/table?lang=en

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Tax	5.88	6.26

Table 18: Allocation

Impact indicators	2022	2023
Number of vehicles with tax exemptions (pcs)	26,975	39,348
GHG emissions avoided by zero-tailpipe emission vehicles (tCO_2eq)	50,046	85,754
Emissions avoided by zero-tailpipe emission vehicles (tCO)	322.6	457.9
Emissions avoided by zero-tailpipe emission vehicles (tNO_x)	19.4	36.8
Number of vehicles with tax exemptions (pcs)	23,694	23,921
GHG emissions avoided by zero-tailpipe emission vehicles (tCO_2eq)	43,958	52,132
Emissions avoided by zero-tailpipe emission vehicles (tCO)	283.4	278.4
Emissions avoided by zero-tailpipe emission vehicles (tNO_x)	17	22.4

Table 19: Impact. Source: Ministry of National Economy

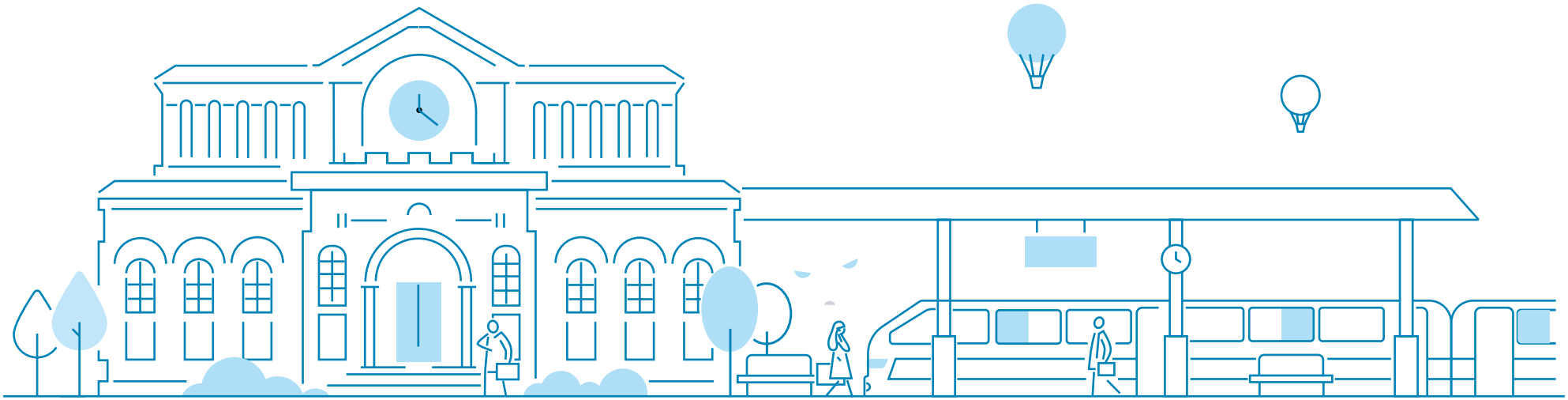
Case study – Reconstruction of railway line Budapest Kelenföld - Székesfehérvár Phase 1/3: Reconstruction of the railway node Székesfehérvár[26]

Székesfehérvár is the regional capital of Central Transdanubia and the ninth-largest city in Hungary. The Székesfehérvár intermodal transport hub project included a major upgrade of the railway junction, modernising signalling and telecommunications infrastructure. To ensure interoperability, ETCS2 was implemented, including a dedicated Radio Block Centre to connect the station with the ETCS-controlled section toward Budapest Kelenföld.

In addition to rail infrastructure, the project significantly enhances modal interchange: on the southern side of the station, a P+R parking facility with 152 parking spaces was built, including parking for persons with reduced mobility. Cyclists were also accommodated: 100 B+R bicycle parking spaces were created near the southern P+R.

The developments have increased the comfortable access of Székesfehérvár railway station and encourage modal change with the added passenger car parking and bike storage.

Impact indicators for this project are shown in *Section III.1.3*.



[26] https://beruhazas.gov.hu/projektek/szekesfehervar-vasuti-csomopont-biztositoberendezesi-es-tavkozlesi-munkai/9525

III.2 Land use & living natural resources

Within the Land use & living natural resources category, expenditures can include sustainable forest management, nature conservation, ecosystem preservation, biodiversity protection and sustainable agriculture.

This category includes projects that generate positive impacts on protected areas, such as Natura 2000 sites, forests, national parks, natural habitats and agricultural areas.

Total allocated amount (HUF bn)	% of total green bond proceeds
65.58	9.74%

Number of KPIs: 41

13 CLIMATE ACTION

15 LIFE ON LAND

III.2.1 Nature conservation and biodiversity

Expenditures related to nature conservation and biodiversity support a wide range of projects aimed at improving of the conservation status of species and habitats, protecting and preserving genetic resources (e.g. traditional varieties), and promoting the sustainable use of preserved genetic resources. Projects focusing solely on animal genetic conservation were excluded from the allocation.

The primary goal of conserving genetic resources is to preserve, maintain and develop the domestic plant genetic base and materials for agricultural, horticultural and forestry production. It also aims to promote the gene rescue and conservation of long-established farm animal breeds that are critically or severely endangered in terms of population size, as well as the protection of indigenous agricultural and wild animal breeds.

Allocation under this programme scheme includes expenditures related to the Environmental and Energy Efficiency Operational Programme (KEHOP), the Competitive Central-Hungary Operational Programme (VEKOP), LIFE biodiversity sub-programme[27], tasks of Hortobágy Nature Protection and Gene Conservation Nonprofit which carries out public benefit activities in the fields of close-to nature management of grasslands and conservation of genetic diversity of traditional animal varieties on more than 7600 ha. The Hortobágy Nature Protection and Gene Conservation Nonprofit also contributes to the protecetion of natural flora and fauna and ensures the preservation of natural conditions necessarry for the survival of protected plant and animal species and communities. Support was provided also for gene conservation institutions, gene conservation tasks promoting on-farm, in situ, ex situ, in vitro plant and animal genetic resources conservation and management. Allocation also covers the expenditures related to the operation of national park directorates and the activities of the National Centre for Biodiversity and Gene Conservation. The co-financing of LIFE projects from EU funds varies between 60% and 75%.

[27]For example, "Conservation of the eastern imperial eagle by decreasing human-caused mortality in the Pannonian Region", "Viability improvement of Hungarian meadow viper populations and habitats in the Pannonian region" and the "Innovative management of Pannonic salt steppes and loess steppic grasslands to benefit plants, insects and birds".

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Intervention	5.81	3.58
Operating	7.14	4.25

Table 20: Allocation

Impact indicators	2022	2023	2024
Nature conservation			
Number of Natura 2000 areas	525	525	525
Number of protected areas	326	327	327
Protected natural areas (ha)	848,924	849,149	849,150
Combined area of Natura 2000 areas and protected natural areas compared to the area of Hungary (%)	22.2	22.2	22.2
Competitive Central-Hungary Operational Programme (VEKOP) and Environmental and Energy Efficiency Operational Programme (KEHOP)			
Number of habitats of community interest with an improving conservation status	7	7	-
Proportion of habitats of community interest with an improving conservation status (%)	16	16	-

Table 21: Impact. Source: Ministry of Agriculture

Projects under KEHOP and VEKOP focus on restoring habitats, improving nature management infrastructure and strengthening the infrastructural background for site surveillance, monitoring, nature education and interpretation. Many projects relate to in-situ habitat conservation, including complex habitat development and rehabilitation, wetland reconstructions, management of grasslands, conservation of forests while some projects may also relate to ex-situ habitat conservation (e.g. nature education). In the EU Taxonomy assessment, only projects related to in-situ conservation were included. VEKOP and KEHOP projects received 85% co-financing rate from EU funds.

National Park directorates complete tasks related to conservation and enhancement of biological diversity as well as monitoring, research and management activities.

The National Centre for Biodiversity and Gene Conservation (NBGK) focuses on the conservation of the genetic diversity of cultivated and wild plants (including endangered plants), indigenous and endangered agricultural animals. The proportion of EU funds in NBGK's total funding was 23% in 2022 and 33% in 2023.

The allocation and impact are in Table 20 and Table 21.

For more information, see *Case study*.

National Centre for Biodiversity and Gene Conservation. Source: Dr. András Attila Takács

Impact indicators	2022	2023	2024
Number of species of community interest with an improving conservation status	23	23	-
Proportion of species of community interest with an improving conservation status (%)	11	11	-
Area of habitats affected by measures aimed at improving conservation status (ha)	154,857	183,734	-
Number of completed projects supporting the improvement of the conservation status of habitats	24	39	-
Number of active participants	7,250	8,444	-
National Park directorates			
Number of national park visitors	1,416,932	1,327,578	1,433,853
Number of national park showrooms	34	44	43
National Centre for Biodiversity and Gene Conservation			
Number of samples of agricultural plant varieties available in gene banks and private individuals coordinated by the NBGK	170,314	172,283	172,283
Number of seed sample requests recorded	2,394	2,554	2,675
The number of seed samples transferred	21,369	22,063	22,872
Number of plant items kept in generative conservation	51,905	52,128	52,311

Table 21 (cont.): Impact. Source: Ministry of Agriculture

Social co-benefit

In case of the projects under KEHOP and VEKOP, participants can engage in interactive communication through information systems designed to present one or more Natura 2000 areas. The social benefit of the programmes is measured in active participation of the target audience. This means that participants were involved in creating campaign products (drawing, photo or other creation, experience report, idea competition, etc.) that reflects the topic of attitude formation, helps to reinforce the professional message, and is tailored to the characteristics of the target group.

The expenditures related to National Park and NBGK have social benefits in addition to the environmental impacts. National Park directorates provide opportunity for visitors to explore the protected natural areas, while the National Centre for Biodiversity and Gene Conservation organises awareness-raising and educational events, prepares publications, and conducts research in national and international cooperations.

Impact indicators	2022	2023	2024
Number of plant items kept in vegetative conservation	260	272	285
Number of plant items preserved in vitro	670	709	709
Number of plant items kept in plantation conservation	2,163	2,208	2,192
Number of awareness-raising and educational events	5	6	3
Number of publications	38	35	66
Number of research programmes	6	6	6

Table 21 (cont.): Impact. Source: Ministry of Agriculture

Greylag gesse taking flight at Fertő-Hánság National Park. Source: Attila Pellinger

Other lake of Tihany Peninsula. Source: Krisztián Hollós

III.2.2 Forestry and habitat conservation

The expenditures on forestry and habitat conservation contribute to diverse projects aimed at improving the conservation status of species and habitats, preserving forests and grasslands under the Natura 2000 network. These measures protect several endangered species, maintain and promote sustainable forestry activities while preserve the genetic resources of Hungarian forest tree species.

This programme scheme refinanced calls under M08, M12, M15 measures within the Rural Development Programme.

Within the Rural Development Programme, the main nature protection measures are focused on forest area development, compensatory payments to Natura 2000 areas and improvement of the viability of forests.

The objective of M08 under the Rural Development Programme (investment expenditures in forest area development and improvement of the viability of forests) is to strengthen the resilience and environmental value of forest ecosystems, to increase the rate of afforestation, to invest in forestry technologies, and to prevent and restore forest damage caused by wildfires and natural disasters. The co-financing of measure M08 projects varies, with EU and EIB funds ranging between 85-92%.

Similarly to measure M08, M15 (forest environmental and climate services and forest conservation) aims at improving water management in forest habitats, the labour-intensive care of forest stands, the preservation and development of forest genetic resources and biodiversity, as well as nature-friendly material handling to improve soil management. The measure M15 EU fund co-financing ratio was 75%.

Measure M12 focuses on the management of Natura 2000 grassland and forest areas used for agricultural and forestry activities. These areas represent some of the most valuable and endangered habitat types from a nature conservation perspective. The measure aims to ensure their management in accordance with nature conservation objectives, while preserving and enhancing biodiversity. The average EU fund co-financing rate was 99.8% for measure M12 projects.

The allocation and impact are in Table 22 and Table 23.

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Intervention	3.45	2.13

Table 22: Allocation

Impact indicators	2022	2023	2024
M08 - Investment expenditures in forest area development and improvement of the viability of forests			
Number of beneficiaries	2,519	2,370	3,278
Area supported for the prevention of forest damage impacting forestry productivity/potential (ha)	1,330	-	1,261
Area supported by investments aiming to enhance the resilience and environmental value of forest ecosystem (ha, cumulated)	5,826	7,152	10,363
Area to be afforested (ha, cumulated)	14,822	22,929	28,124
M12 - Natura 2000 and Water Framework Directive payments			
Number of beneficiaries	11,354	13,838	12,192
Area supported (ha)	330,572	459,800	395,354
M15 - Forest environmental and climate services and forest conservation			
Number of beneficiaries	232	261	367
Areas affected by forest environmental protection (ha)	11,079	9,468	12,123

Table 23: Impact. Source: Ministry of Agriculture

III.2.3 Sustainable agriculture

The programme scheme aims to support the sustainable development of rural areas and to promote the sustainable use of the environment, its natural resources and landscape, as well as to promote and preserve genetic resources and ecological farming.

Under this programme scheme, expenditures related to M04, M10, M11 measures under the Rural Development Programme and expenditures under the Common Agricultural Policy (CAP) Strategic Plan were refinanced.

Within the Rural Development Programme, green bond proceeds refinanced M10 measures focusing on conserving the genetic resources of rare and endangered plant species (ex-situ). In addition, these projects provide financial support for agri-environmental activities, which main objective is to support the sustainable development of rural areas, preserve and improve environmental conditions, reduce agricultural environmental pressures, provide environmental services, and strengthen agricultural practices based on the sustainable use of natural resources. Agri-environmental payments also aim to support the preservation of biodiversity in natural conditions (on the farm), protect nature, water and soil through the establishment of production structures suited to site-specific conditions. The co-financing of measure M10 projects varies between 75-76% from EU funds.

Projects related to M11 promote both the maintenance and conversion of organic farming activities. The main goal of the support is to preserve biodiversity and enhance favourable conservation status. The project supports the production of ecological propagation material, thus contributing to ecological plant breeding. The co-financing of EU of measure M11 projects was between 77-80% from EU funds.

Projects under measure M04 support the non-productive investments for habitat development purposes. The goal of the support is to restore and develop the ecosystem services provided by the agricultural landscape, preserve and improve the conservation status of species and habitats, and strengthen the public welfare functions of Natura 2000 areas and high natural value farming systems. Measure M04 projects received 75% co-financing from EU funds.

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Intervention	0.21	39.00

Table 24: Allocation

Impact indicators	2022	2023	2024
M10 - Agri-environment-climate			
Number of beneficiaries	11,707	17,043	805
Area covered by agri-environment-climate measures (ha)	518,041	1,211,181	131,734
Number of supported plant genetic resources for agriculture and food and microorganisms	79,621	90,572	82,632
M11 - Organic farming			
Number of beneficiaries	3,494	5,273	104
Supported area - conversion to organic farming (ha, cumulated)	18,499	80,164	79,610
Supported area - maintaining organic farming (ha, cumulated)	207,427	312,404	314,294
M04 - Investment expenditures in physical assets			
Number of beneficiaries	30	8	2

Table 25: Impact. Source: Ministry of Agriculture

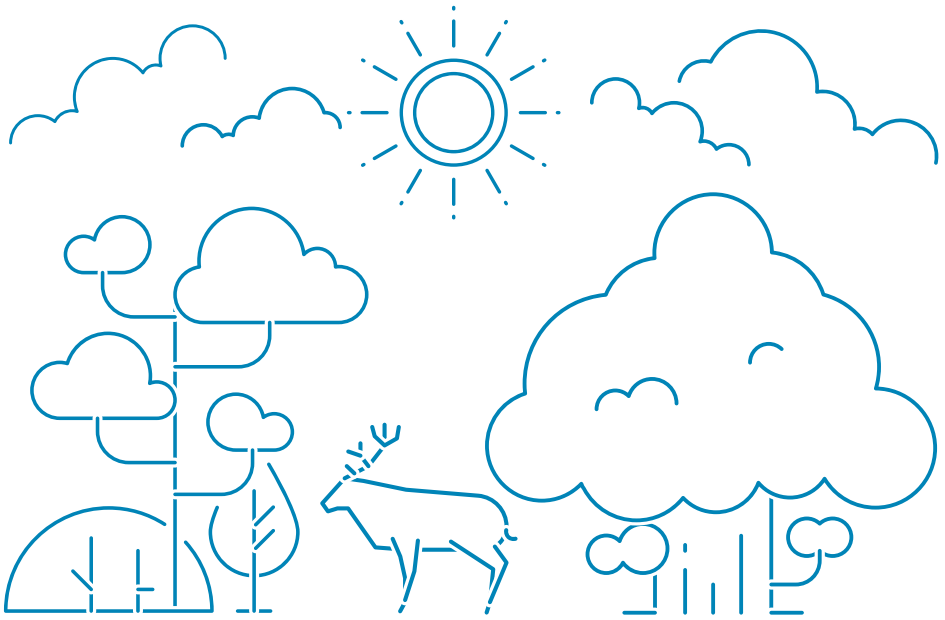
Hungary's CAP Strategic Plan seeks to strengthen the economy of rural areas and guide them towards sustainable development, while taking advantage of the opportunities provided by modern technologies. The expenditures related to the CAP Strategic Plan include agri-environment payments and support for organic farming. Projects under the CAP Strategic Plan were 50% co-financed by EU funds.

The allocation and impact are in Table 24 and Table 25.

Duna-Drava National Park Directorate

Impact indicators	2022	2023	2024
CAP Strategic Plan			
Area covered by agri-environment-climate measures (ha)	-	-	1,130,854
Area supported (ha)	-	-	235,198
Supported area - conversion to organic farming (ha)	-	-	62,204
Supported area - maintaining organic farming (ha)	-	-	172,994

Table 25 (cont.): Impact. Source: Ministry of Agriculture



Case study – Long term conservation of Pannonian grasslands and related habitats through the implementation of PAF strategic measures[28]

Hungary's grasslands are predominantly semi-natural habitats shaped by centuries of traditional land use, including grazing, hay-making, and water regulation. These ecosystems hold high biodiversity value but depend on active management to maintain their conservation status. Socio-economic changes have sharply reduced demand for pastures and hay-making meadows, resulting in widespread abandonment. This trend has led to habitat degradation, loss of characteristic flora and fauna, and fragmentation of ecological corridors.

Strategic Response

The LIFE-IP GRASSLAND-HU project addresses these challenges by implementing the Hungarian Prioritised Action Framework (PAF) for Natura 2000. The initiative targets ten habitat types protected under the EU Habitats Directive, focusing on semi-natural grasslands of significant conservation value. The approach combines habitat restoration, invasive species control, and hydrological improvements with stakeholder engagement and capacity building.

Objectives

- Restore and manage grasslands for biodiversity conservation.
- Prevent shrub encroachment and afforestation.
- Mitigate habitat fragmentation and re-establish ecological corridors.
- Eradicate invasive alien species (IAS).
- Promote sustainable land use and reduce misuse, including tourism-related pressures.
- Enhance farmer awareness and participation in conservation practices.
- Improve water regimes critical for grassland ecosystems.
- Update conservation measures for priority species and habitats.

Batuz Farm LIFE IP GRASSLAND-HU. Source: Zita Zsembery

[28] https://webgate.ec.europa.eu/life/publicWebsite/project/LIFE17-IPE-HU-000018/long-term-conservation-of-pannonian-grasslands-and-related-habitats-through-the-implementation-of-paf-strategic-measures

Expected Outcomes and Impact

- 30 Natura 2000 sites with improved conservation status for semi-natural grasslands and related habitats (e.g., steppic woodlands).
- 77 ha of land secured for conservation and 40 ha of arable land converted to grassland.
- 480 ha cleared of native shrub encroachment and 922 ha treated for IAS eradication.
- Hydrological restoration on 2,000 ha, improving water regimes for targeted habitats.
- Establishment of six European hamster colonies and four lesser mole-rat colonies, supporting species recovery.
- Priority grassland habitats stabilized or expanded by up to 10%, with typical species populations increasing by 0-15%.
- Infrastructure and conditions enabling traditional, nature-friendly land management practices.

Contribution to Green Bond Objectives

This project exemplifies how targeted financing can deliver measurable biodiversity benefits, strengthen ecosystem resilience, and support EU conservation commitments. By integrating land acquisition, habitat restoration, and stakeholder engagement, LIFE-IP GRASSLAND-HU demonstrates the scalability of nature-based solutions within a structured investment framework.

Impact indicators for this project are shown in *Section III.2.1.*

Strázsa Hill LIFE IP GRASSLAND-HU Source: Zita Zsembery

III.3 Pollution prevention & control

This category includes projects related to waste management that contribute to the growth of the circular economy and environmental remediation projects. The green bond proceeds were allocated to projects that finance the purchase of assets and equipment, the development of waste management processes and the expansion of waste recycling and processing capacity of companies, as well as remediation of environmental sites and large-scale volunteer clean up initiatives.

Economic activities related to the treatment of hazardous waste were excluded from the allocation.

Total allocated amount (HUF bn)	% of total green bond proceeds
4.30	0.64%

Number of KPIs: 12

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

III.3.1 Supporting waste management tasks

Expenditures related to waste management tasks include the development of the circular economy, such as purchase of equipment (e.g. optical waste separator, quality testing tool), process development and capacity increase through encouraging the use of secondary raw materials, decrease of incineration and landfilling.

Allocation includes financial support for developing waste management related to waste from products subject to environmental product fee.

SMEs received funding for the increase of waste processing capacity of existing activities and for the procurement of assets that support the waste processing activities (e.g. improving the recycling of packaging film waste, production of cellulose insulation made from recycled paper waste).

This main programme scheme is fully financed by the state budget.

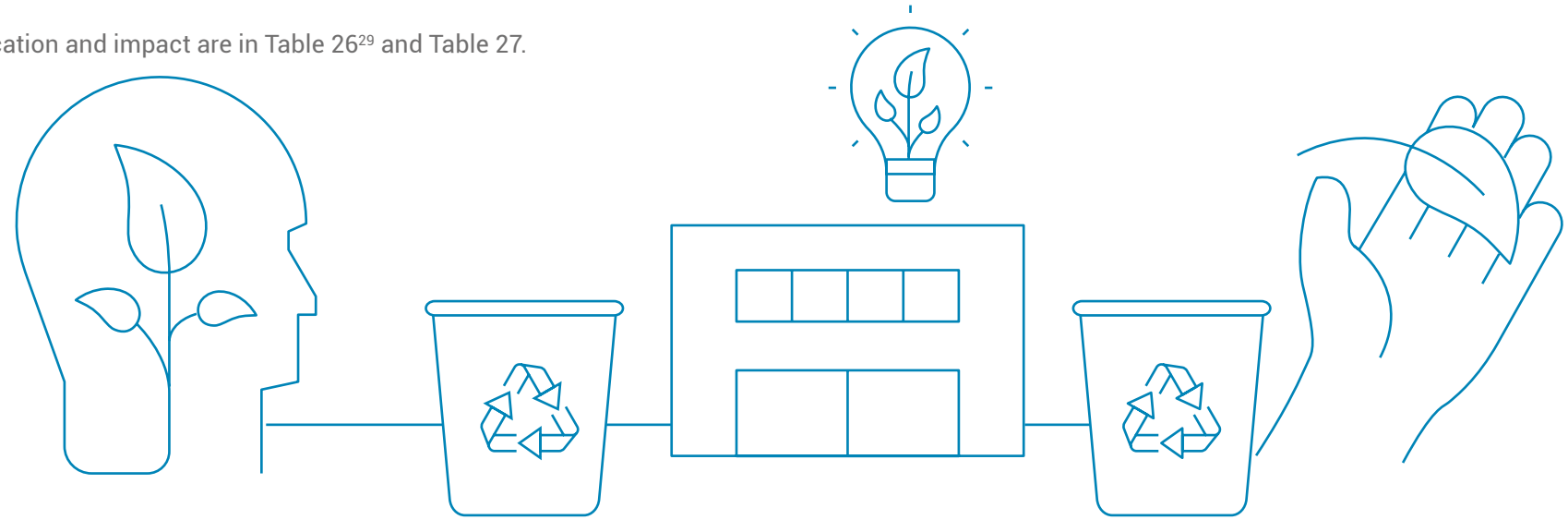
The allocation and impact are in Table 26[29] and Table 27.

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Intervention	0.56	-

Table 26: Allocation

Impact indicators	2022	2023
Number of supported projects (non-hazardous waste only) (pcs)	8	-

Table 27: Impact. Source: Ministry of Energy



[29]Expenditures for 2023 were excluded this due to limited data availability.

III.3.2 Environmental remediation

This programme scheme includes remediation projects that are primarily aimed at eliminating dangerous and toxic substances from contaminated land and groundwater, ensuring the protection of natural resources such as air, water, soil, and wildlife. These initiatives utilise a variety of specialised remediation technologies, each selected according to the specific nature and extent of pollution at a given site, in order to restore the ecological balance and improve the environmental quality of the affected areas.

The supported remediation projects have been undertaken in several key locations, including the area surrounding Szekszárd, Berhida, Gyálai Holt-Tisza, and Szentendre, where targeted interventions have contributed to the recovery of local ecosystems.

Allocation was used to refinance calls under the Environmental and Energy Efficiency Operational Programme (KEHOP). The projects are co-financed by the EU, with a 15% ratio of state budget which is fully covered by the green bond.

The allocation and impact are in Table 28 and Table 29.

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Capital	2.35	0.96

Table 28: Allocation

Impact indicators	2022	2023
Total remediated area (surface projection) (ha)	65 (total for 2022-2023)	
Number of supported projects (pcs)	6 (total for 2022-2023)	

Table 29: Impact. Source: Ministry of Public Administration and Regional Development

III.3.3 Other waste related projects

The allocation under this category focuses on large-scale volunteer clean-up initiatives, which play an important role in reducing pollution and protecting ecosystems. Their primary purpose is to remove waste from rivers, forests and public spaces, preventing further environmental degradation and safeguarding biodiversity. Beyond their direct ecological benefits, they also raise awareness of sustainable practices and highlight the consequences of improper waste management. These efforts often involve thousands of participants, demonstrating the power of collective action in addressing environmental challenges.

Green bond proceeds under this programme scheme were used for TeSzedd! (Pick It Up!) - Volunteer for a Clean Hungary and PET Kupa (Plastic Cup)[30] initiatives.

TeSzedd! (Pick It Up!) - Volunteer for a Clean Hungary is Hungary's largest voluntary waste collection movement. The PET Kupa (Plastic Cup) is a pioneering civic initiative that uses a playful approach, involving young people and a range of innovative solutions to clean up rivers and floodplains, uncover illegal landfills and tackle recurring pollution in a unique way at European level.

This main programme scheme is partially financed by the state budget.

The allocation and impact are in Table 30 and Table 31.

For more information, see *Case study*.

Social co-benefit

On a social level, the projects included in this main programme scheme strengthen community bonds, encourage civil responsibility, and inspire individuals to take an active role in caring for their surroundings.

[30] https://petkupa.hu/eng/

[31] Including competitions and awareness-raising events. The Plastic Workshop (Műanyag Műhely) is an educational initiative of the Plastic Cup, aimed at encouraging plastic reuse and recycling among school-aged children. They have reached over 10,000 participants, each of whom has completed a 45-60-minute plastic literacy experience consisting of several interactive stations — both within Hungary and beyond, across 7 countries.

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Operating	0.27	0.16

Table 30: Allocation

Impact indicators	2022	2023
Total waste collected (t)	924.9	1,834.8
PET Kupa (Plastic Cup)		
Size of detected contaminated area (river km)	250 (2022-2023)	
Recycling ratio of waste collected (%)	60 (2022-2023)	
Size of remediated area (river km)	300 (2022-2023)	
Pollutants removed (t)	130 (2022-2023)	
Number of participants (persons)	1,500 (2022-2023)	
Number of events (pcs)[31]	19 (2022-2023)	
TeSzedd! (Pick It Up!) - Volunteer for a Clean Hungary		
Number of participants (persons)	40,000	97,000
Number of meeting points (pcs)	893	2,200

Table 31: Impact. Source: Ministry of Energy

Case study – Plastic Cup[32]

PET Kupa, also known as the Plastic Cup, was established in Hungary in 2013 to address the growing issue of plastic pollution along the Tisza River. Each year, floodwaters transport large quantities of PET bottles and other plastic waste downstream from neighbouring countries, creating severe ecological challenges. The initiative responds by mobilising volunteers to collect waste that is later recycled and/or repurposed by transforming it into functional boats that are later used in organized river competitions. This innovative approach integrates environmental protection with active community participation.

The impact of PET Kupa extends beyond immediate cleanup efforts. By systematically removing significant volumes of plastic from the Tisza and its floodplains, the initiative mitigates ecological damage, protects biodiversity, and prevents pollutants from entering larger water systems. At the same time, it places strong emphasis on public awareness and education through school programs, exhibitions, and media outreach, promoting responsible waste management practices across society.

What distinguishes PET Kupa is its combination of environmental restoration, community engagement, and cross-border cooperation. Not only does it address a pressing ecological problem, but it also fosters a culture of stewardship and international collaboration. In doing so, the initiative demonstrates how innovative, participatory models can deliver tangible benefits for both people and the environment.

Over the course of 13 years:

- a total of 367.08 tons of waste was collected;
- a total of 959 kilometres of river (rkm) has been remediated — with both sides of the river cleaned, this amounts to 1,918 kilometres;
- as part of the waste monitoring activities, approximately 2,500 river kilometres were covered;
- around 440 tons of pollutants have been removed.

Impact indicators for this project are shown in *Section III.3.3.*

[32] https://petkupa.hu/eng/

PETII and Plastic Kayak. Source: PET Kupa

Collecting waste at PET Kupa. Source: PET Kupa

III.4 Climate adaptation

Climate adaptation projects support activities related to the anticipation of adverse effects of climate change, natural disasters and take action to strengthen the resilience and adaptive capacity of the country.

Expenditures related to climate adaptation include measures enhancing resiliency and managing climate risks, as well as measures supporting the monitoring and prediction of weather and environmental conditions.

Total allocated amount (HUF bn)	% of total green bond proceeds
2.52	0.38%

Number of KPIs: 6

13 CLIMATE ACTION

III.4.1 Measures enhancing resiliency and managing climate risks

Expenditures under this programme scheme include a call related to M04 measure under the Rural Development Programme and the LIFE SandBoil project under the LIFE Program.

The supported project under M04 promotes territorial water retention and helps to reduce or prevent the burdens and pollution affecting surface and groundwater bodies. Throughout these efforts, climate change-related problems can be mitigated, while safeguarding the quantity and quality of water resources. Measure M04 projects were co-financed on a 75% rate by EU funds.

The LIFE SandBoil project applies solutions to mitigate flood risk due to sand boils reactivations along the Po River (Italy) and in Hungary. The Hungarian part of the project received 58% EU co-financing.

The allocation and impact are in Table 32 and Table 33.

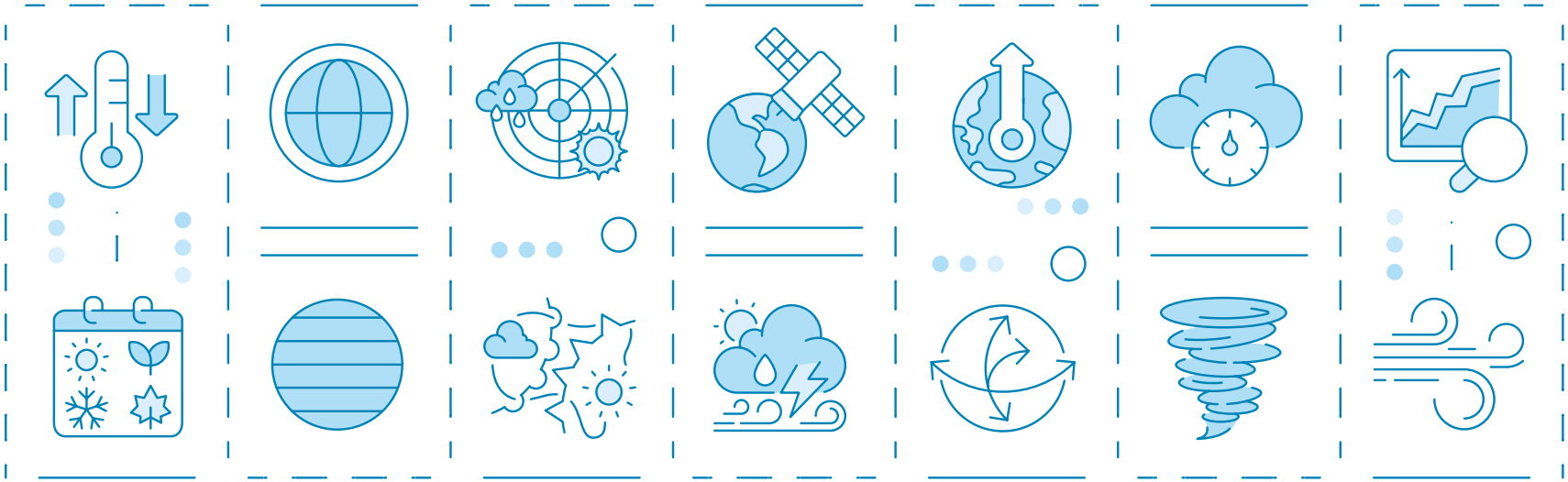
For more information, see *Case study*.

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Intervention	0.06	0.01

Table 32: Allocation

Impact indicators	2022	2023	2024
M04 - investment expenditures in physical assets			
Number of beneficiaries	3	-	1

Table 33: Impact. Source: Ministry of Agriculture

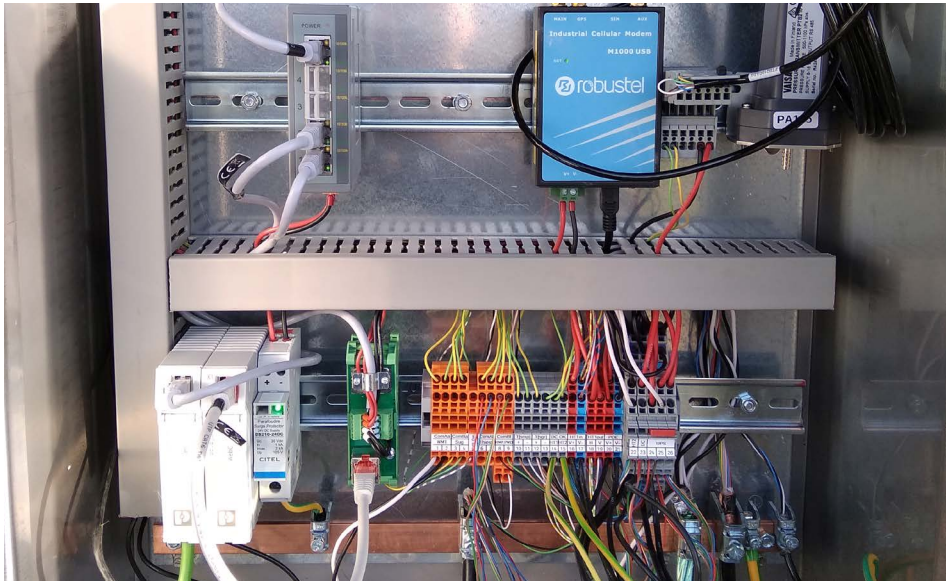


III.4.2 Measures supporting the monitoring and prediction of weather and environmental conditions

The key aspect of this programme scheme is to support the operation of the Hungarian Meteorological Service (HungaroMet, previously OMSZ), which collects, processes, provides meteorological data and information as well as promotes innovative climate adaptation projects. The operation of HungaroMet is partially financed by the state budget. In the reporting period, 7 projects of HungaroMet were supported.

The project details are summarised in Table 36.

The allocation and impact are in Table 34 and Table 35.



Electronic cable box for the operation of the instruments of the Vásárosnamény meteorological station, implemented from the ROHU102 project.

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Operating	1.74	0.72

Table 34: Allocation

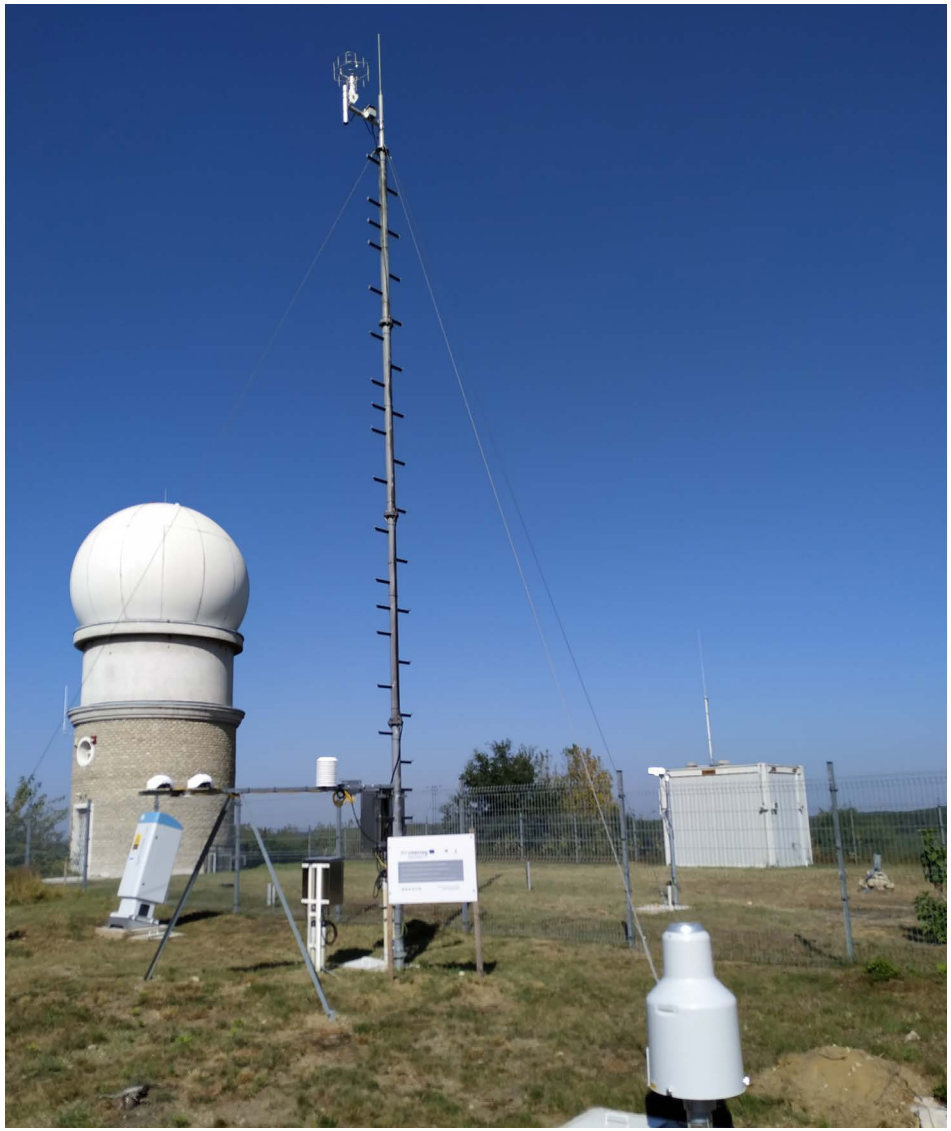
Impact indicators	2022	2023
Number of ongoing projects (pcs)	4	5
Mapping the effects of climate change in Hungary by conducting regional climate model simulations and developing a representative database		
Number of knowledge bases built or developed (pcs)	3	-
Interreg Romanian-Hungarian cross-border / Mitigating the negative effects of hail in Satu Mare (Szatmár) county		
Population size benefiting from the hail-suppression system service (persons, annually)[33]	350,000	
Number of meteorological stations built (pcs)	9	-
Participation in the work of the Climate Change Multidisciplinary National Laboratory		
Number of peer-reviewed articles published (pcs)	1	4

Table 35: Impact. Source: HungaroMet

[33]Population size of the area that is covered by the services.

Name	Description
Mapping the effects of climate change in Hungary *(project finished in 2022)*	Conducting regional climate model simulations. Carrying out sensitivity studies, validation experiments, and projection simulations. Developing a representative database. Three new climate data and knowledge bases.
Interreg Romanian-Hungarian cross-border / Mitigating the negative effects of hail in Satu Mare (Szatmár) county *(project duration: 2018 - 2025)*	Construction of a hail-suppression system with a soil generator in the territory of Satu Mare (Szatmár) County, Romania. Mitigating the negative effects of hail.
Participation in the work of the National Laboratory for Water Science and Water Security *(project duration: 2022-2026)*	Providing data and expertise for climate change-related studies in the project. Developing warning systems based on short-term and ultra-short-term models. Participating in the installation of meteorological instruments.
Participation in the work of the Climate Change Multidisciplinary National Laboratory *(project duration: 2022-2026)*	Production of climate data sets necessary for examining the effects of climate change. Development of an information system supporting the complex examination of the effects of climate change. Participation in the installation of meteorological instruments.
Destination Earth On-Demand Extremes Digital Twin (DEODE) *(project duration: 2022-2024)*	Creation of high-resolution forecasting system for Europe using ACCORD limited-range models. Provision of baseline data for impact studies in hydrology and air quality. Generation of configurable forecasts based on user-defined requirements.
CAMS National Collaboration Programme – Hungary *(project duration: 2023-2024)*	Improvement of public alert systems and European Environment Agency reporting. Collaboration with large cities; identification of urban information requirements; promotion of Hungarian Meteorological Service website. Reporting of natural dust contributions under Ambient Air Quality Directives.
Provision of Open Access to Public Meteorological Data and Development of Shared Federated Data Infrastructure for the Development of Information Products and Services (RODEO) *(project duration: 2023-2025)*	Improvement of access to EU-classified High Value meteorological data. Development of APIs for in-situ, radar, climate, and alert data themes. Assistance to national meteorological services in data sharing. Promotion of standardized formats, a unified catalogue, and harmonized access.

Table 36: Details of HungaroMet projects. Source: HungaroMet



Meteorological instruments and equipment implemented from the ROHU102 project in the meteorological measuring garden of HungaroMet's radar station in Napkor

Case study – Natural-based solution to mitigate flood risk due to sand boils reactivations[34]

Backward erosion piping (BEP) is a critical failure mechanism in river embankments, triggered by seepage through sandy aquifers during high-water events. This process manifests as sand boils—localized fluidization of sand under upward seepage pressure—leading to progressive erosion and pipe formation beneath embankments. If unchecked, BEP can cause riverbank collapse and catastrophic flooding. Climate change has intensified flood frequency, duration, and severity, increasing BEP-related risks.

In Italy, approximately 130 sites along the Po River exhibit sand boils. Current management relies on emergency containment and traditional engineering measures such as landside berms or diaphragm walls, which are costly and often ineffective.

Strategic Response

The LIFE SandBoil project introduces BOilDown, an innovative, sustainable, and cost-effective nature-based solution to halt piping progression beneath riverbanks. By stabilizing embankments and reducing erosion risk, the intervention significantly lowers flood risk. The implementation of this solution also contributes to the EU Taxonomy activity CCA 14.2. Flood risk prevention and protection infrastructure, therefore it adheres to international sustainability definitions.

The initiative aims to demonstrate the technology at pilot scale, then replicate it across all catalogued Po River sites and extend application to the Danube River in Hungary. Long-term objectives include global replication through design and maintenance guidelines.

Objectives

- Deploy BOilDown prototype and validate performance.
- Develop a universal design for large-scale application across flood-prone river segments.
- Demonstrate cost-effectiveness compared to conventional methods.
- Reduce socio-economic losses from embankment failure and emergency interventions.
- Produce guidelines for sustainable BEP risk mitigation worldwide.

[34] https://webgate.ec.europa.eu/life/publicWebsite/project/LIFE19-ENV-IT-000071/natural-based-solution-to-mitigate-flood-risk-due-to-sand-boils-reactivations-along-the-po-river

Geotechnical investigation – CPT testing and borehole samples at PO river

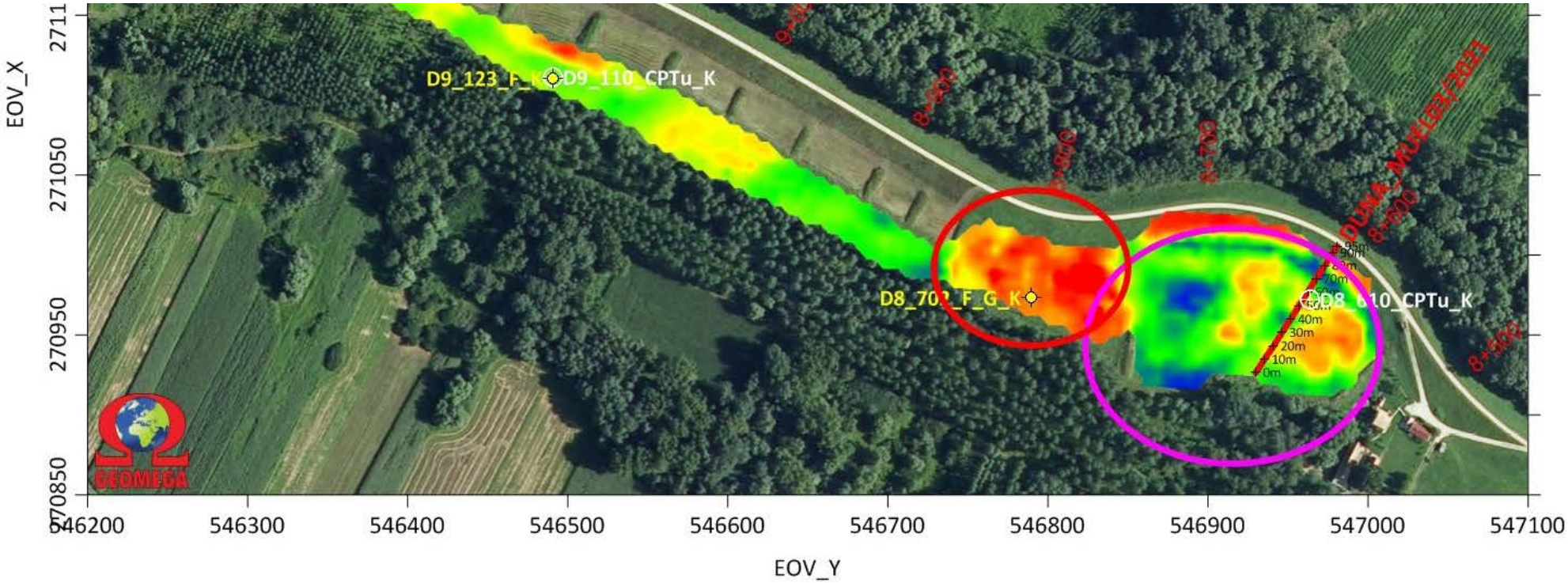
Expected Outcomes and Impact

- Prototype implementation and preparation of a scalable solution for 130 Po River sites and additional Danube River locations.
- Cost efficiency: Average application cost below EUR 200,000, compared to EUR 2 million for traditional measures, plus elimination of recurring emergency costs (currently EUR 20,000 per reactivation, annual budget approx. EUR 500,000).
- Risk reduction: 5-6% improvement in flood resilience for affected populations; intervention prevents failures that could cause damages estimated at EUR 200 million.
- Environmental benefits: Reduced emergency restoration activities, avoiding approx. 0.5 tonnes of CO_2 emissions annually.
- Knowledge transfer: Guidelines for design, installation, and maintenance to enable replication across Europe and globally.

Contribution to Green Bond Objectives

This project demonstrates how targeted investment in nature-based engineering can deliver climate adaptation benefits, reduce disaster risk, and generate significant cost savings. LIFE SandBoil exemplifies scalable innovation for resilient infrastructure aligned with EU sustainability frameworks.

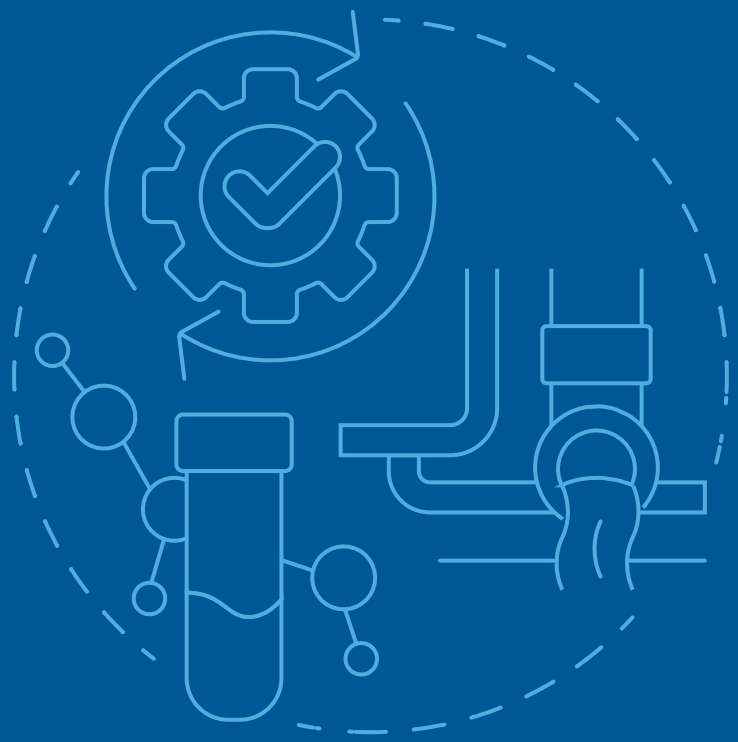
Impact indicators for this project are shown in *Section III.4.1.*



Results of the geophysical investigation at the Danube

III.5 Sustainable water & wastewater management

The aim of the projects under Sustainable water & wastewater management is to deploy innovative solutions for efficient water usage and to provide everyone with adequate infrastructure.



Total allocated amount (HUF bn)	% of total green bond proceeds
0.10	0.02%

Number of KPIs: 8

6 CLEAN WATER AND SANITATION

III.5.1 Increasing water efficiency in agriculture

This programme scheme focuses on efficient water use in agriculture, including water saving irrigation methods, climate-resilient production methods and sustainable land use.

Under this programme scheme, green bond proceeds were used to refinance expenditures related M04 measure under the Rural Development Programme.

The expenditures aim to support the development of the agricultural water management sector and the modernisation of horticulture. The measures strengthen the security of agricultural production and promote its adaptation to climate change. The supported actions include water retention, sustainable water management, the wider use of efficient irrigation technologies, the adoption of climate-resilient farming practices and sustainable land use, as well as efforts to achieve or maintain the good quantitative status of surface and groundwater bodies. The related projects received 75% co-financing from EU and EIB funds.

The allocation and impact are in Table 37 and Table 38.

For more information, see *Case study.*

Expenditure type	2022 (HUF bn)	2023 (HUF bn)
Intervention	0.09	0.02

Table 37: Allocation

Impact indicators	2022	2023	2024
Projects supported	261	200	230
Establishment of natural filtration field before discharging the collected water into catchment	1	-	-
Construction of land reclamation road	1	-	-
Existing irrigation equipment with improved water efficiency (pcs)	34	27	-
New irrigation equipment purchased (pcs)	95	91	-
Irrigation equipment with improved energy efficiency (pcs)	29	26	-
New projects relating to new irrigated orchards (number)	43	68	-
Area affected by water saving investments (e.g. more efficient irrigation systems) (ha, cumulated)	18,881	25,900	31,764

Table 38: Impact. Source: Ministry of Agriculture

Case study – Development of the agricultural water management sector[35]

The effects of global climate change are already impacting Hungary, posing a range of new challenges for farmers. Alongside global climatic changes, clear shifts have been observed in Hungary's temperature and precipitation patterns. Over the past three decades, daily maximum temperatures have risen dramatically, while annual precipitation has decreased. As a result, both the amount and temporal distribution of rainfall are becoming more extreme and unpredictable, and therefore drought-affected areas require irrigation. Due to uneven rainfall distribution and more frequent droughts, the exposure of agriculture to climate change continues to increase.

The aim of the call VP2-4.1.4-16 - Development of the agricultural water management sector under the Rural Development Programme is to support measures that strengthen the security of agricultural production and its adaptation to climate change. Eligible activities in this call are:

- Development of facilities to supply water to irrigation systems, ensuring sustainable water availability.
- Establishment of filter fields to reduce excess nutrient loads and harmful water before transfer to receiving watercourses.
- Construction of improved roads connected to agricultural areas to enhance accessibility and efficiency.
- Upgrading existing irrigation equipment for better water use efficiency.
- Development and reconstruction of irrigation infrastructure and related structures.
- Purchase of new, modern irrigation equipment.
- Creation of new irrigation water supply works.
- Increasing the energy efficiency of irrigation equipment to reduce environmental impact.

The target group of the call consists of those agricultural producers whose developments contribute to improving the stability and competitiveness of agricultural yields, while ensuring the responsible management of water resources.

Impact indicators for this project are shown in *Section III.5.1.*

[35] https://archive.palyazat.gov.hu/vp2-414-16-a-mezgazdasgi-vzgazdlkodsi-gazat-fejlesztse

Aerial view of agricultural fields with lake Balaton

IV. EU Taxonomy assessment

IV. EU Taxonomy assessment

Hungary is committed to showcase the eligibility and alignment of the allocated expenditures with the EU Taxonomy. An EU Taxonomy assessment was prepared by Morningstar Sustainalytics for Hungary's Green Bond Framework (2023) based on the Climate Delegated Act. Additionally, Hungary is dedicated to preparing a self-assessment each reporting period for the allocated expenditures based on the EU Taxonomy Delegated Acts in force. For this Report, the EU Taxonomy Climate Delegated Act[36] and its amending regulation[37], and the Environmental Delegated Act[38] was taken into account.

To determine the level of alignment with the EU Taxonomy criteria, relevant stakeholders were engaged to assess each project. The assessments were based on multiple interviews, questionnaires and the related supporting documentation provided by the relevant ministries and beneficiaries. In addition, publicly available documents and statistics were also used for the evaluation. After identifying projects that fulfilled the EU Taxonomy's eligibility criteria, projects were assessed based on the EU Taxonomy relevant technical screening criteria (TSC), including substantial contribution (SC) and do no significant harm (DNSH).

The assessed projects may fall under three categories, described in Table 39. An overview of the assessment result is described in Table 40, while the breakdown of the assessed expenditures can be observed in Table 41. A case study has been prepared to demonstrate Hungary's rigorous assessment approach (see *Case study)*.

The **minimum safeguards (MS)** criteria are considered fulfilled since projects refinanced by the green bond proceeds are associated with entities that operate in the EU and therefore obliged to meet certain standards related to human and labour rights, taxation, and fair competition. Hungary has implemented the Act on occupational safety and health[39], the National Occupational Safety and Health Policy[40,41], the Act on social participation in the preparation of legislation[42], Government Decree on mandatory minimum wage and the guaranteed minimum wage[43], the Act on the promotion of employment and unemployment benefits[44] and the Fundamental Law of Hungary[45]. Additionally, Hungary is a signatory of the OECD Guidelines for Multinational Enterprises, setting up National Contact Points (NCP) to implement the guidelines.[46] Anti-bribery and anti-corruption topics are addressed in the National Anti-Corruption Programme[47] and the Criminal code[48]. The country implemented Act on the proclamation of the Convention for the Protection of Human Rights and Fundamental Freedoms.[49] Hungary has also signed nine fundamental, four governance and sixty technical ILO (International Labour Organisation) conventions.[50]

[36] http://data.europa.eu/eli/reg_del/2021/2139/2025-01-08
[37] http://data.europa.eu/eli/reg_del/2023/2485/oj
[38] http://data.europa.eu/eli/reg_del/2023/2486/oj
[39] https://njt.hu/jogszabaly/1993-93-00-00
[40] https://cdn.kormany.hu/uploads/document/4/48/48c/48c0999a11d2e7741d110165f40505ec9d341513.pdf
[41] https://mvff.munka.hu
[42] https://njt.hu/jogszabaly/2010-131-00-00
[43] https://njt.hu/jogszabaly/2024-308-20-22
[44] https://njt.hu/jogszabaly/1991-4-00-00.142
[45] https://njt.hu/jogszabaly/2011-4301-02-00
[46] https://njt.hu/jogszabaly/2017-245-20-22
[47] https://njt.hu/jogszabaly/2024-1025-30-22
[48] https://njt.hu/jogszabaly/2012-100-00-00
[49] https://njt.hu/jogszabaly/1993-31-00-00
[50] https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:102679

	EU Taxonomy eligible	EU Taxonomy partially aligned	EU Taxonomy aligned
Description	The activity fulfils the description of the relevant EU Taxonomy activity.	The activity fulfils the description and the substantial contribution criteria but only partially or does not fulfil the DNSH criteria of the relevant EU Taxonomy activity.	The activity fulfils the description, the substantial contribution and DNSH criteria of the relevant EU Taxonomy activity.
Criteria	Eligibility: **fulfilled** Substantial contribution: **partially or not fulfilled** Do no significant harm: **partially or not fulfilled**	Eligibility: **fulfilled** Substantial contribution: **fulfilled** Do no significant harm: **partially or not fulfilled**	Eligibility: **fulfilled** Substantial contribution: **fulfilled** Do no significant harm: **fulfilled**

Table 39: Definitions of EU Taxonomy assessment categories

Green categories	Allocated amount (HUF bn)	EU Taxonomy eligible (%)	EU Taxonomy partially aligned (%)	EU Taxonomy aligned (%)
Clean transportation (III.1)	600.57	100%	94.06%	5.94%
Land use & living natural resources (III.2)	65.58	11.55%	-	-
Pollution prevention & control (III.3)	4.30	90.03%	-	-
Climate adaptation (III.4)	2.52	97.68%	-	97.33%
Sustainable water & wastewater management (III.5)	0.10	-	-	-
Total	673.08	91.29%	83.92%	5.67%

Table 40: EU Taxonomy assessment results by green category

							DNSH assessment in details					
Green Category	EU Taxonomy activity	Overall assessment result	Allocated amount (HUF bn)	Eligibility	SC	DNSH	Climate change mitigation	Climate change adaptation	Sustainable use and protection of water and marine resources	Transition to a circular economy	Pollution prevention and control	Protection and restoration of biodiversity and ecosystems
Clean transportation	CCM 6.1 Passenger interurban rail transport	Aligned	24.05	Passenger railway transport services	**Fulfilled**	**Fulfilled**	N/A	●	N/A	●	●	N/A
	CCM 6.14. Infrastructure for rail transport	Aligned	11.65	Operation of the Hungarian railway network and associated railway infrastructure development	**Fulfilled**	**Fulfilled**	N/A	●	●	●	●	●
	CCM 6.1 Passenger interurban rail transport	Partially aligned	358.42	Passenger railway transport services	**Fulfilled**	**Partially fulfilled**	N/A	○	N/A	●	●	N/A
	CCM 6.14. Infrastructure for rail transport	Partially aligned	174.71	Operation of the Hungarian railway network	**Fulfilled**	**Partially fulfilled**	N/A	◐	●	●	●	◐
	CCM 6.14. Infrastructure for rail transport	Partially aligned	1.55	Railway infrastructure development	**Fulfilled**	**Partially fulfilled**	N/A	◐	●	●	●	●

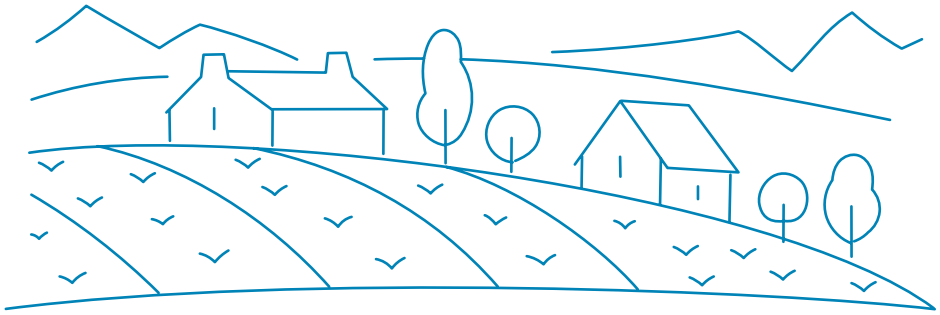
● Fulfilled ◐ Partially fulfilled ○ Not fulfilled

Table 41: Breakdown of the EU Taxonomy assessment results (N/A: there is no DNSH criteria for the environmental objective as described in the EU Taxonomy for this economic activity)

Green Category	EU Taxonomy activity	Overall assessment result	Allocated amount (HUF bn)	Eligibility	SC	DNSH	DNSH assessment in details: Climate change mitigation	Climate change adaptation	Sustainable use and protection of water and marine resources	Transition to a circular economy	Pollution prevention and control	Protection and restoration of biodiversity and ecosystems
Clean Transportation	CCM 6.15. Infrastructure enabling low-carbon road transport and public transport	Partially aligned	18.04	Renovation of metro line M3	**Fulfilled**	**Partially fulfilled**	N/A	◐	●	○	●	●
Clean Transportation	CCM 6.5. Transport by motorbikes, passenger cars and light commercial vehicles	Partially aligned	12.15	Tax exemptions for electric and zero-emission vehicles	**Fulfilled**	**Partially fulfilled**	N/A	○	N/A	◐	◐	N/A
Land use & Living Natural Resources	CCM 1.3. Forest management	Eligible	5.09	Expenditures under measure M08[51] related to the forest and habitat conservation	**Partially fulfilled**[52]	**Partially fulfilled**	N/A	○	○	○	●	◐

● Fulfilled ◐ Partially fulfilled ○ Not fulfilled

Table 41 (cont.): Breakdown of the EU Taxonomy assessment results (N/A: there is no DNSH criteria for the environmental objective as described in the EU Taxonomy for this economic activity)



[51]M08 - Investment expenditures in forest area development and improvement of the viability of forests

[52]The Taxonomy requires a climate benefit analysis consistent with the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. On project level, the criteria could not be fulfilled. However, it is important to note that Hungary prepares the GHG inventory every year that includes the measurement of carbon sequestration of forests in Hungary (LULUCF sector).

							DNSH assessment in details					
Green Category	EU Taxonomy activity	Overall assessment result	Allocated amount (HUF bn)	Eligibility	SC	DNSH	Climate change mitigation	Climate change adaptation	Sustainable use and protection of water and marine resources	Transition to a circular economy	Pollution prevention and control	Protection and restoration of biodiversity and ecosystems
Land use & Living Natural Resources	CCM 1.4. Conservation forestry	Eligible	0.48	Expenditures under measure M15 related to the forest and habitat conservation[53]	**Partially fulfilled**[54]	**Partially fulfilled**	N/A	○	○	●	●	◐
	BIO 1.1. Conservation, including restoration, of habitats, ecosystems and species	Eligible	0.02	Expenditures under measure M12 related to the forest and habitat conservation[55]	**Partially fulfilled**[56]	**Partially fulfilled**	●	○	○	N/A	◐	N/A
	BIO 1.1. Conservation, including restoration, of habitats, ecosystems and species	Eligible	1.98	Projects under the KEHOP and VEKOP programme contributing to in-situ habitat conservation	**Partially fulfilled**[57]	**Partially fulfilled**	●	○	●	N/A	●	N/A

● Fulfilled ◐ Partially fulfilled ○ Not fulfilled

Table 41 (cont.): Breakdown of the EU Taxonomy assessment results (N/A: there is no DNSH criteria for the environmental objective as described in the EU Taxonomy for this economic activity)

[53]M15 - Forest environmental and climate services and forest conservation

[54]Forest management plans include habitat conservation aspects, such as an assessment of the proportion of biotope trees, protected areas and tree species, however, a detailed impact and difficulty analysis is not required. As a result, the substantial contribution criteria cannot be fully met.

[55]M12 - Natura 2000 and Water Framework Directive payments

[56]See *Case study*.

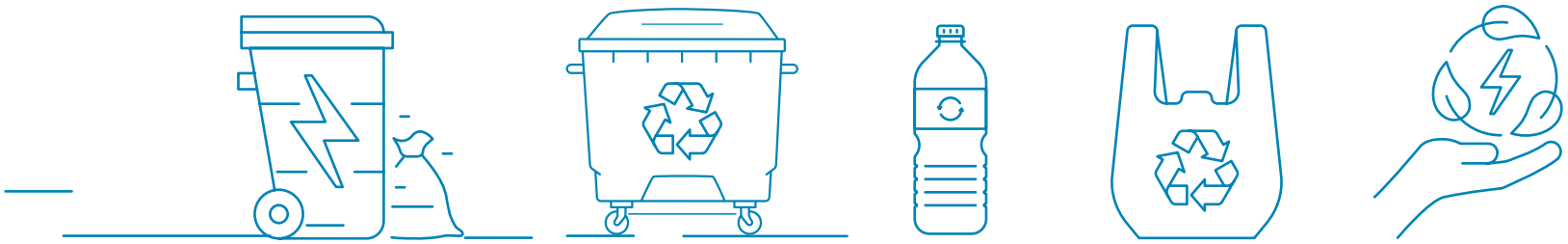
[57]The audit process requirements for nature conservation activities within VEKOP and KEHOP are partially aligned with the substantial contribution criteria of the EU Taxonomy.

DNSH assessment in details

Green Category	EU Taxonomy activity	Overall assessment result	Allocated amount (HUF bn)	Eligibility	SC	DNSH	Climate change mitigation	Climate change adaptation	Sustainable use and protection of water and marine resources	Transition to a circular economy	Pollution prevention and control	Protection and restoration of biodiversity and ecosystems
Pollution prevention & control	PPC 2.4. Remediation of contaminated sites and areas	Eligible	3.31	Remediation of contaminated sites and areas	**Partially fulfilled**[58]	**Partially fulfilled**	◐	○	●	●	N/A	●
	CCM 5.9. Material recovery from non-hazardous waste	Eligible	0.56	Projects that contribute to the procurement of assets and to the increase of capacity for material recovery	**Partially fulfilled**[59]	**Partially fulfilled**	N/A	◐	N/A	N/A	N/A	◐

● Fulfilled ◐ Partially fulfilled ○ Not fulfilled

Table 41 (cont.): Breakdown of the EU Taxonomy assessment results (N/A: there is no DNSH criteria for the environmental objective as described in the EU Taxonomy for this economic activity)



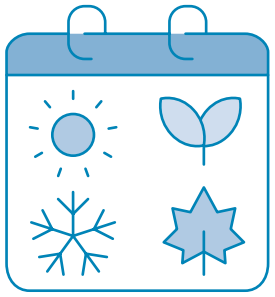
[58]In Hungary, remediation activities are controlled activities that must follow documented procedures (site investigation, intervention and monitoring), stringent regulations and are authorised by the competent authorities. On the other hand, information was not available at the time of the assessment to determine whether the remediation activities are not carried out by the operator (Hungarian State) that caused the pollution or a person acting on behalf of that operator. Due to this missing information, the substantial contribution criteria was assessed partially fulfilled.

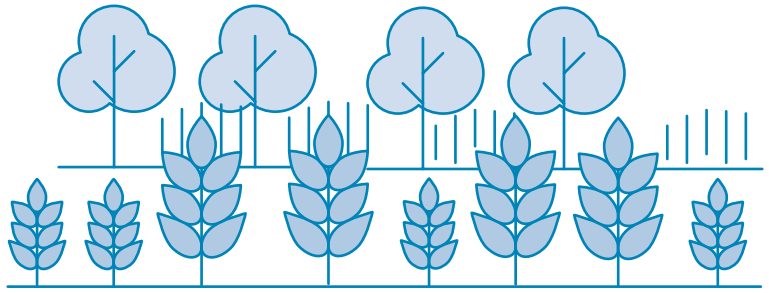
[59]The projects convert non-hazardous waste into secondary raw materials that are suitable for the substitution of virgin materials, however the required weight could not be documented, thus the substantial contribution criteria are partially fulfilled.

							DNSH assessment in details					
Green Category	EU Taxonomy activity	Overall assessment result	Allocated amount (HUF bn)	Eligibility	SC	DNSH	Climate change mitigation	Climate change adaptation	Sustainable use and protection of water and marine resources	Transition to a circular economy	Pollution prevention and control	Protection and restoration of biodiversity and ecosystems
Climate adaptation	CCA 9.1. Engineering activities and related technical consultancy dedicated to adaptation to climate change	Aligned	2.46	Hungaro-Met's activity focusing on consultancy and engineering activities dedicated to adaptation to climate change	**Fulfilled**	**Fulfilled**	●	N/A	●	N/A	N/A	N/A
	CCA 14.2 Flood risk prevention and protection infrastructure	Eligible	0.01	The LIFE SandBoil project, which applies solutions to mitigate flood risk	**Not assessed**	**Not assessed**	-	N/A	-	-	-	-

● Fulfilled ◐ Partially fulfilled ○ Not fulfilled

Table 41 (cont.): Breakdown of the EU Taxonomy assessment results (N/A: there is no DNSH criteria for the environmental objective as described in the EU Taxonomy for this economic activity)





Case study

EU Taxonomy activity	Section	Overall EU Taxonomy assessment
BIO 1.1. Conservation, including restoration, of habitats, ecosystems and species	*III.2.2*	Eligible

Eligibility

The allocated expenditure supports Natura 2000 forest and grasslands (under the Rural Development Programme), aiming to ensure the preservation of biodiversity and contributing to maintaining and restoring favourable conservation status. The Natura 2000 network encompasses the vast majority of natural areas in Hungary that were previously designated as protected by dedicated legislation such as national parks, landscape protection areas, and nature reserves.

Substantial contribution to protection and restoration of biodiversity and ecosystems – Partially fulfilled

The areas receiving the compensation payments under this allocation include protected natural areas under national nature conservation, Natura 2000 sites, and areas of high nature value (MTÉT areas).

Act LIII. of 1996 on Nature Conservation[60] in Hungary sets provision for the general conservation of natural values and areas, their natural systems and biodiversity as well as for the promotion of their scientific cognition and sustainable use. According to the act, it is prohibited to disturb, harm, torture, or kill individuals of protected animal species, as well as to endanger their reproduction or other life activities, or to destroy or damage their habitats, including living, feeding, breeding, resting, or hiding sites. One of the main objectives of Hungary's **National Biodiversity Strategy**[61] is to establish a coherent network of protected areas, improving the status of protected areas and Natura 2000 sites, and developing specific land use standards for grassland and arable land in the Natura 2000 areas to protect the wildlife and ensure an appropriate conservation management.

Hungary has prepared the **Prioritised Action Framework (PAF) for 2021-2027**[62], which is a multiannual strategic planning tool for an overview of the measures needed to establish the Natura 2000 network and related green infrastructure across the European Union. It also identifies the associated funding needs and links them to the appropriate EU financing programmes.

The **Birds and Habitats Directives** sets out the overall legal framework for protecting and managing Natura 2000 sites. The conservation objectives and the corresponding measures must be defined within six years following the official approval of the site (Article 4(4) of the Habitats Directive), together with the designation of the area as a Special Conservation Area.

Conservation objectives and priorities defined for all Natura 2000 sites in Hungary are listed in Standard Data Forms (SDF). Hungary also prepares **management plans**[63] for Natura 2000 sites, which is considered more of a strategic document that informs land managers, landowners, and relevant authorities about the nature conservation directives and the recommended measures for their implementation. The plans determine the measures aimed at preserving, maintaining, and restoring the favourable conservation status of Natura 2000 sites. The plans are independent documents, but their measures may also form parts of other plans, such as nature conservation management plans or other conservation-related plans. The documents are tailored to the site's current condition, designated values, management practices and opportunities, and articulate in a site-specific and practically applicable manner the general conservation objectives for the Natura 2000 site and the recommended measures or regulations corresponding to them.

[60] https://njt.hu/jogszabaly/1996-53-00-00
[61] https://www.cbd.int/doc/world/hu/hu-nbsap-v3-en.pdf
[62] https://termeszetvedelem.hu/wp-content/uploads/2021/07/Natura2000_Intezkedesi_Terv_2021marcius.pdf
[63] https://termeszetvedelem.hu/elfogadott-fenntartasi-tervek

A document called **Guidelines for the preparation of Natura 2000 management plans**[64] was published in order to support the preparation of management plans and to promote the development of plans with a uniform structure and content.

The national regulation concerning the Natura 2000 network is founded on **Government Decree 275/2004 (X. 8) on nature conservation areas of European Community importance**[65], which determines the requirements necessary for the conservation of habitat types and species of community interest (listed in the annexes) occurring in Natura 2000 sites. Measures that serve to maintain, preserve, and restore the favourable conservation status of habitat types and species of community interest or of priority community interest (in a Natura 2000 site) are established by: a) a nature conservation management plan; b) another conservation-oriented plan prepared under separate legislation, or any plan that protects or has impact on a Natura 2000 area; c) a management (maintenance) plan; or d) a contractual arrangement concerning the implementation of the objectives. The decree defines the requirements of the Natura 2000 management plans (Annex 13). Requirements for the Natura 2000 management plan and the documentation on which it is based must contain information on the threats and pressuring factors, the conservation objectives and purpose of the site, species-conservation measures, habitat reconstruction and habitat improvement, grant and funding sources, documentation of consultation process of the plan, including consultations with authorities etc. Documentation supporting the preparation of the Natura 2000 management plan must include a description of the baseline state of the area's environmental conditions, climatic conditions, hydrological condition, soil / edaphic condition, natural conditions, habitat types, plant species, animal species, other important species of community interest occurring in the planning area. The management plan also includes a detailed assessments of land use, ownership, and management practices such as agriculture, forestry, wildlife management, and tourism. It also provides maps showing the planning area, habitat types, and boundaries of protected natural areas of national and community importance. The plans are **approved by the Deputy State Secretary** responsible for nature conservation, acting on behalf of the Minister responsible for nature conservation, based on the decision of the **Expert Committee on the Natura 2000 Management Plans.** The site operator undertakes the obligation to prepare a new plan, aligned with the nature conservation objectives before the end of the previous plan's validity period.

[64] https://termeszetvedelem.hu/_user/browser/File/N2k_fennterv/Utmutato_Natura2000fenntartasiterv_%C3%A1tdolgozott_2018febru%C3%A1r.pdf
[65] https://njt.hu/jogszabaly/2004-275-20-22

To regularly assess the conservation status of species and natural habitats of community importance, their populations, domestic distribution, and conservation status must be regularly monitored, with a special attention given to the research of these species and habitat types. Regarding monitoring, the sampling procedures, developed within Hungary's **National Biodiversity Monitoring System**[66] (operating since 1997), provide a solid foundation for monitoring Natura 2000 sites.

Natura 2000 forests

Applicants requesting support under M12 (Rural Development Programme) must possess a legally approved forest management plan for the supported forest, authorized by the forestry authority. Natura 2000 management plans are integrated into these forest plans, making them legally binding for forest managers. They include descriptions of the expected contributions of the area to nature conservation objectives defined by the competent nature or environmental protection authority.

The main regulations regarding forest management in Hungary are the **Act XXXVII. of 2009 on Forests, the Protection of Forests, and Forest Management**[67]**,** and the **Ministry of Agriculture Decree 61/2017. (XII. 21.) on its implementation**[68]**.**

To protect forest resources and ensure sustainable forest management, Hungary's forest areas are divided into so-called forest planning districts, each covering an average of 10,000 to 15,000 hectares of forest. Forestry activities within these districts must be carried out according to the forest plans established by the forestry authority. These plans ensure the professionalism and sustainability of forest management by defining management opportunities and obligations, aiming to prevent the reduction of forest area, deterioration of forest conditions, and to preserve natural values. During regional forest planning, special regulations pertaining to forest areas under nature conservation, water management, heritage protection, and defence laws must also be considered. Additional regulations may apply depending on the designated purpose of the forest area. Forest plans are adopted by forestry authorities every ten years following a detailed review process regulated by the law. Compliance with the planned forest management is monitored by the forestry authority. Data from forest plans, along with various other forest-related information form part of the **National Forest Inventory Database.**[69]

[66] http://www.termeszetvedelem.hu/_user/downloads/biomon_eng/biodiverzitas-angolbeliv-low-res.pdf
[67] https://njt.hu/jogszabaly/2009-37-00-00.54
[68] https://njt.hu/jogszabaly/2017-61-20-11
[69] https://nfi.nfk.gov.hu/

Natura 2000 grassland

Under the M12, applicants managing Natura 2000 grassland areas are required to prevent the establishment and spread of invasive and non-native plant species and to ensure the reduction of their populations.

The **provisions of the Government Decree 269/2007 (X. 18.) concerning the rules of land use for the maintenance of Natura 2000 grass lands**[70] sets out strict regulations, for example overgrazing of grasslands is prohibited; during agricultural activities, permanent damage to the grassland surface is forbidden; spreading manure is prohibited; and the establishment and spread of invasive and non-native plant species must be prevented, their populations must be controlled through mechanical methods or the application of specific herbicides; the use of other chemicals beyond this technology is prohibited.

The EU Taxonomy criteria requires to have an audit on the management plan (or equivalent document) which covers the nature conservation area and to issue a certification as a result of the inspection. Information was not available on the certification criteria, therefore the substantial contribution criteria for this expenditure was assessed partially fulfilled. The M12 Natura 2000 compensation payments do not require a Natura 2000 management plan from the benificaries. These plans are prepared by the national park authorities. Therefore, the substantial contribution criteria for this expenditure was assessed partially fulfilled.

Do no significant harm

The supported activity does not result in the degradation of land or marine environments with significant carbon stocks.

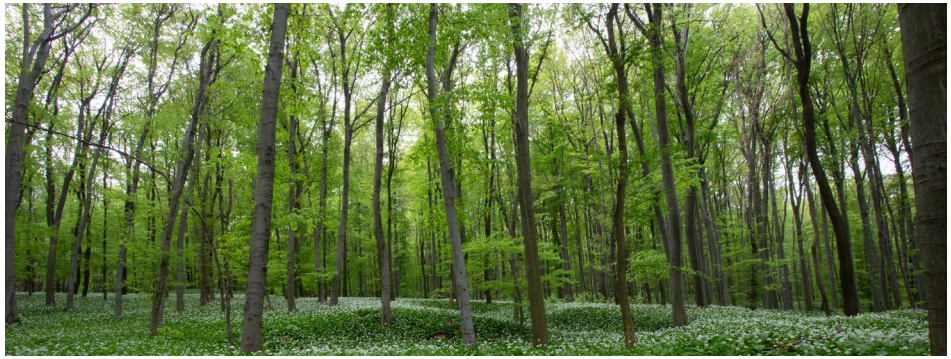
A **SWOT analysis** of the Rural Development Programme was conducted including climate adaptation and sustainable use of water, but not on a beneficiary level and not as detailed as the Taxonomy requirement to fulfil the criteria. Measure M12 does not require a detailed vulnerability risk assessment.

The use of pesticides is not typical in forest areas. The use of pesticides requires the approval of the forestry authority, while in protected natural areas, the approval of the nature conservation authority is also required. Fertilisers are not used in forest management. A work log must be maintained to enable effective monitoring. In the event of chemical treatment, the beneficiary is required to report the use of plant protection products to the forestry authority via a designated form. Only pesticides that are permitted for forestry purposes and have been reported to the forestry authority can be used.

For the compensation payments provided to Natura 2000 grasslands, the call must also comply with the requirements set out in **Ministry of Agriculture Decree 16/2024. (IV. 9.) on the conditions applicable to support under the Common Agricultural Policy Strategic Plan**[71], which prohibits the conversion or ploughing of grasslands designated as environmentally sensitive permanent grasslands within Natura 2000 sites.

Among the objectives of the measure are the preservation and improvement of the condition of the environment, including soil and water.

The SWOT analysis of the Rural Development Programme was not conducted on a beneficiary level and is not as detailed as the Taxonomy requirement for certain DNSH criteria, therefore the overall DNSH criteria for this project was deemed partially fulfilled.



Habitats. Source: Dr. András Attila Takács

[70] https://njt.hu/jogszabaly/2007-269-20-22

[71] https://njt.hu/jogszabaly/2024-16-20-7R

Appendix – Impact methodologies

For the impact assessment of the supported projects, besides the ICMA Handbook Harmonised Framework for Impact Reporting (June 2024 edition), own indicators were also used. The Report includes the annual impact data (ex-ante and ex-post) of the projects refinanced by green bonds on a project portfolio and (where feasible) project-by-project basis with a time horizon of two or (where feasible) three years. The impacts of operating expenditures are captured only for the year(s) of allocation. Where annual data are not available for an impact metric, aggregate or cumulative data are shown.

The Report showcases 90 indicators:

- 18 core and 6 other indicators included in the ICMA Handbook - Harmonised Framework for Impact Reporting;
- 66 own indicators that are not included in the ICMA Handbook - Harmonised Framework for Impact Reporting but describe properly the impacts of the expenditures. Own indicators are provided by the relevant ministries, beneficiaries and ÁKK's model for socio-economic effect.

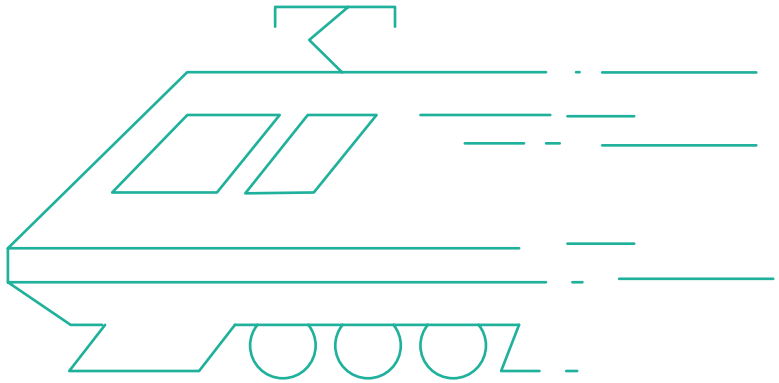
The impacts are calculated based on various methodologies, which may be adjusted due to data updates and data collection developments over time.

A.1 Electrification ratio for reimbursement of uncovered costs of railway passenger traffic and operation of the railway network

Green bond proceeds were only used to support the operation related to electrified railway infrastructure and railway passenger transport with electrically powered trains. The electrification ratio of the railway was determined based on the reimbursed costs (operating costs minus income) of:

- electrified railway line operation of MÁV Infrastructure Co. Ltd. and GYSEV; and
- electrified railway passenger transportation of MÁV Passenger Transport Co. and GYSEV.

Railway lines dedicated to the transport of fossil fuel were not included in the allocation.



A.2 GHG emission avoidance in terms of modal shift to railway transportation

The GHG emissions avoided through the projects supporting railway transportation are estimated based on the assumption that passengers who use electric railway transportation shifted from passenger cars or long-distance buses. The impact of these modal shifts is shown in Table 42.

For the calculation, the following information was used:

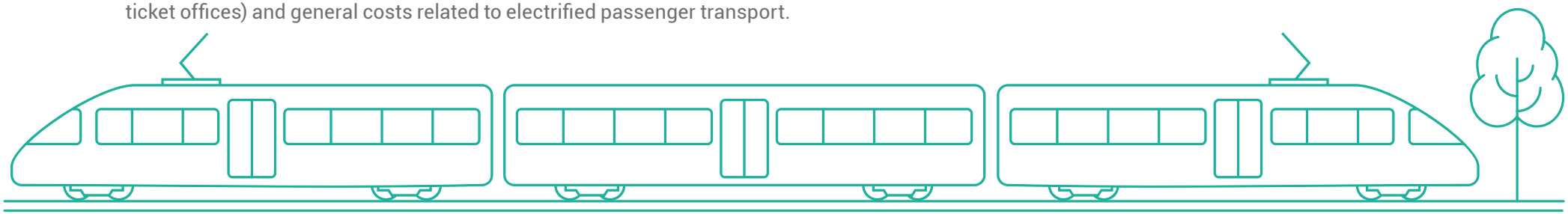
- GHG emissions from rail passenger transport per passenger-kilometre (average value) based on MÁV Passenger Transport Co. assessment;[72]
- GHG emissions from passenger car transport per passenger-kilometre (average value) based on MÁV Passenger Transport Co. assessment, adjusted for electric cars, and for 2023 also hybrid cars;
- GHG emissions from bus transport per passenger-kilometre (average value) based on MÁV Passenger Transport Co data for Volánbusz;[73]
- substitution ratio for railway passenger transportation based on Eurostat data on modal split of inland passenger transport (calculated values are shown in Table 43);[74]
- share of green bond proceeds allocated to reimburse MÁV Passenger Transport Co. and GYSEV operating costs, which includes direct (e.g. operating personnel, direct costs of rolling stock, infrastructure usage), indirect (e.g. ticket offices) and general costs related to electrified passenger transport.

	2022	2023[75]
Passenger cars	130g	124.4g
Long-distance buses	2g	4.49g

Table 42: Avoided gCO_2 per passenger kilometre due to the modal shift to rail transport from passenger cars and long-distance buses

	2022	2023
Passenger cars	83%	84%
Buses	17%	16%

Table 43: Substitution ratio for railway passenger transportation. Source: Eurostat, own calculations



[72] https://www.mavcsoport.hu/sites/default/files/upload/page/denkstatt_szakertoi_velemeny.pdf
[73] Volánbusz Ltd merged into MÁV Passenger Transport Co.
[74] https://ec.europa.eu/eurostat/databrowser/view/tran_hv_psmod/default/table?lang=en

[75] The calculation methodology has been further developed with more precise data that was previously not available. The calculation for 2023 impact also includes hybrid cars besides electric vehicles.

A.3 GHG emission avoidance in terms of modal shift for zero emission cars

Regarding tax exemptions (registration tax, motor vehicles tax, company car tax and motor vehicle duty) for zero-tailpipe emission cars (electric and other zero-emission vehicles), the calculation of GHG emission avoidance was primarily based on the 2020 methodology of the Ministry of Finance.[76]

For the calculation, the following information was used:

Number of vehicles and mileage

- The average annual mileage of the electric vehicles is from Ministry of National Economy for 2022 and from the Institute for Transport Sciences for 2023;
- The annual stock of zero-tailpipe emission, ICE (internal combustion engine; petrol and diesel) and hybrid vehicles are from the Hungarian Central Statistical Office[77] and Ministry of National Economy.

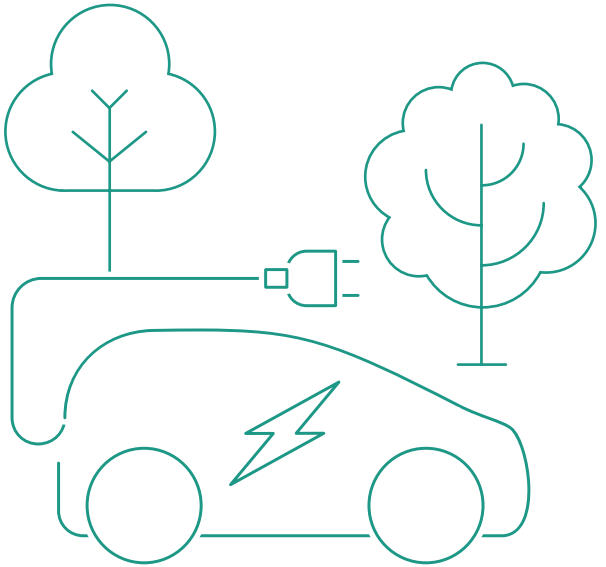
Average fuel (l/km) and electricity consumption (kWh/km)

- Average electricity and fuel consumption values were calculated based on the 2020 methodology of Ministry of Finance[76] for 2022 and updated by the Institute for Transport Sciences using the COPERT methodology for 2023;[78]
- For hybrid cars, both electric and ICE modes were considered.

Average emission from fuel combustion (g/l) and electricity generation (g/kWh)

- GHG emission from electricity production is based on EEA emission report;[79]
- CO_2 emission from fuel combustion is based on the 2020 methodology of Ministry of Finance[76] for 2022 and updated based on the Belgian Ecoscore methodology[80] for 2023;
- For hybrid cars, both electric and ICE modes were considered.

For calculating CO and NO_x avoided, the Euro 6 emission standards for ICE passenger vehicles were applied.[81]



[76] On 1 January 2025, Ministry of Finance merged into the Ministry of National Economy.
[77] https://www.ksh.hu/stadat_files/sza/en/sza0025.html
[78] https://copert.emisia.com/copert/methodology/

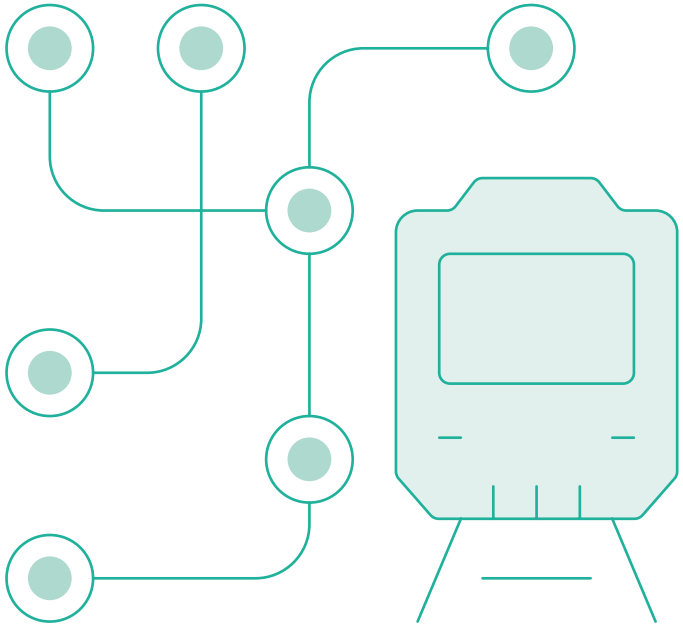
[79] https://www.eea.europa.eu/en/analysis/maps-and-charts/co2-emission-intensity-15
[80] https://ecoscore.be/en/homepage/faq/general-information
[81] https://www.eea.europa.eu/en/analysis/publications/explaining-road-transport-emissions

A.4 GHG emission avoidance for urban public transport

In connection with the upgrade of metro line M3, a climate benefit analysis was prepared.

The estimation of GHG emissions avoidance was determined using the following parameters provided by BKV Ltd.:

- emissions of cars (189 gCO_2eq/km);
- change in annual mileage for buses and passenger cars due to the operation of metro line M3;
- Annual energy savings of BKV Ltd. converted into CO_2eq (10,242 $tCO_2eq/year$).



A.5 Low-carbon GDP and employment effects

The estimates based on Leontief model show how much lower the GDP and employment in low-carbon industries would be without the refinanced projects, i.e. how much higher the GDP and employment are in these industries as a result of an economy-wide multiplier process.[82]

The main information related to the calculation is as follows:

- The latest available NACE Rev. 2 division-level symmetric (industry by industry) input-output table for Hungary is 2020;
- The refinanced expenditures on 2022 and 2023 prices and the derived GDP and employment effects on 2020 prices are adjusted (discounted and compounded) by the relevant implicit price indices;
- The low-carbon threshold is set to 1 g per HUF gross value added. The refinanced activities are considered low carbon;
- Data: Hungarian Central Statistical Office (input-output table, implicit price indices), Eurostat (employment, GHG emissions).

Note that GDP is a flow variable, therefore the sum of effects for 2022 and 2023 is self-evident, i.e. $effect_{2022\&2023}=effect_{2022}+effect_{2023}$. As the employment level is a stock variable, the sum here conveys the upper limit of individuals affected, i.e. $effect_{2022\&2023} \leq effect_{2022}+effect_{2023}$ (equality exists if the set of employees concerned in the two years are disjoint).

[82]For full methodological details, see Bokor L.: Estimating low-carbon GDP and employment effects of green expenditures. (Forthcoming)

Contact

ÁKK Zrt.
Registered seat: 1013 Budapest, Krisztina tér 2.
Postal address: 1253 Budapest, Pf.: 85
Electronic contact: www.akk.hu/contact
Email: green.hungary@akk.hu

Disclaimer

The Report is provided for information purposes only and is protected in its entirety by the provisions of the Act LXXVI of 1999 on copyright. Any reproduction of the content, in full or in part, by any means whatsoever, without the permission of Hungary as the copyright holder, is strictly prohibited. The Report may not be copied, published, distributed, transmitted or used in any other way without attribution to the source.

The data and methodologies in the Report are based on the information available on the date of publication, and herein are believed to be reliable and have been obtained from sources believed to be reliable. In no event shall Hungary be liable for any direct or consequential loss, damage, cost, charge, expense or other liability whatsoever, arising out of or in connection with the use of, or reliance upon, the information contained in the Report.

The Report does not constitute an offer or invitation to sell, or any solicitation of any offer to subscribe for or purchase, any securities to any person in any jurisdiction.

2024