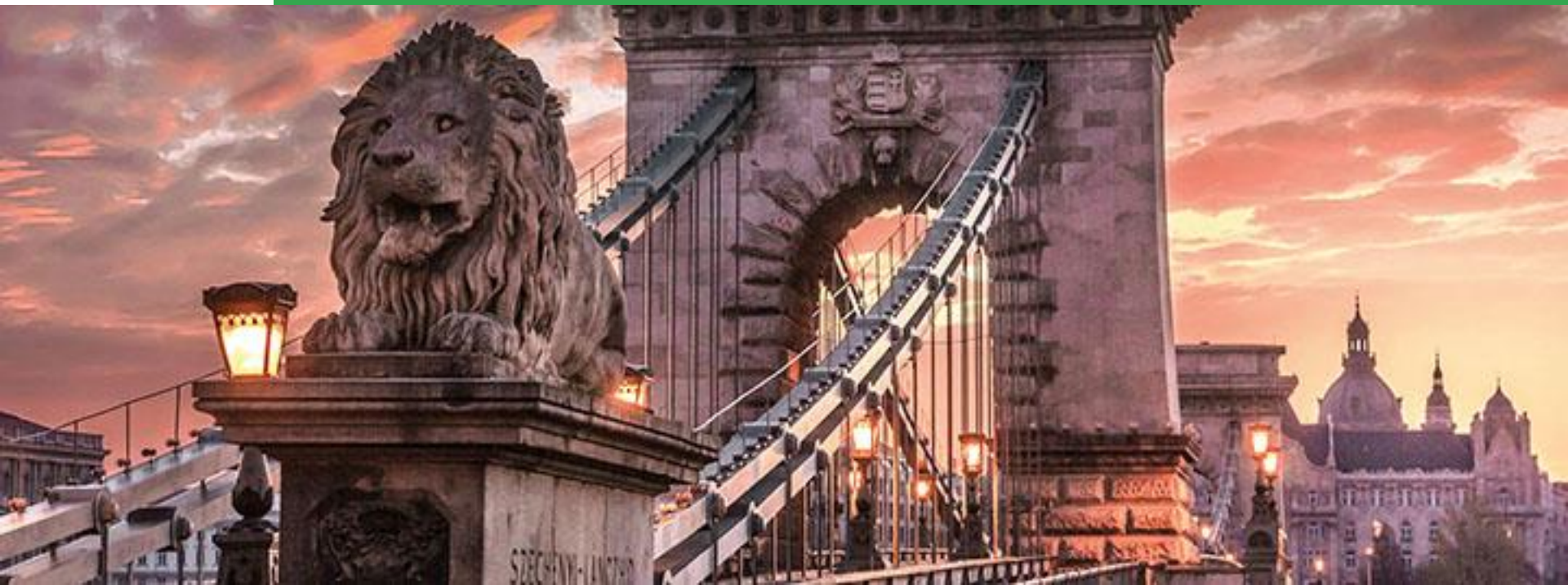
GOVERNMENT DEBT MANAGEMENT AGENCY PTE LTD.

ÁKK

GREEN BOND INVESTOR PRESENTATION

May 2020



PRESENTERS

Gábor Gion, State Secretary
Ministry of Finance

- Mr. Gábor Gion is the Minister of State for Financial Policy Affairs in the Hungarian Ministry of Finance, since November 2018.
- He graduated from Eötvös Lóránd University as a mathematician in 1992.
- Early in his career he worked at Arthur Andersen Hungary, Ernst & Young and Deloitte. In 2009 he became the Chairman and CEO of Deloitte Hungary. Between 2009 and 2018 he was responsible for the government relations of Deloitte Hungary.
- He is a honorary associate professor at University of Miskolc.

Péter Kaderják, State Secretary
Ministry of Innovation and Technology

- Dr. Péter Kaderják is the Minister of State for Energy Affairs and Climate Policy in the Hungarian Ministry of Innovation, since June 2018.
- He is Ph.D. in Management and Business Administration and MSc in economics, both from Corvinus University of Budapest.
- He has been the Director of REKK, the Regional Centre for Energy Policy Research at the Corvinus University of Budapest from 2004 to 2018.
- Formerly he had several positions in public administration. Among others, he served as the President of the Hungarian Energy Office and as a member of ACER's Board of Appeal (2011-16).

Zoltán Kurali, Chief Executive Officer
Government Debt Management Agency of Hungary ("ÁKK")

- Mr. Zoltán Kurali was appointed as Chief Executive Officer of ÁKK in 2019.
- He graduated from the Budapest University of Economics in 1998.
- He started his professional career during his studies as a research analyst at various local brokerages. He worked at BNP-Dresdner Securities and Citibank Hungary
- He moved to Deutsche Bank Hungary in August 2006 as deputy CEO, and became CEO in 2007. He co-headed CEEMEA Financing & Solutions Group from 2016, and became sole head from 2018 until his departure from Deutsche Bank.

KEY FACTS AND FIGURES ON HUNGARY

Area: 93,023 sq. kilometres

Capital: Budapest

Population: 9.8m

Life expectancy: 76.1 years

Currency: Forint (HUF)

Exchange rate (2019): 290.65 HUF = 1.00 USD[1]

Nominal GDP (2019): HUF 46,787 billion

Real GDP growth (2019): 4.9%

Public debt (2019): HUF 29,682 billion

Public debt in foreign currency (2019): HUF 5,121bn (EUR 15 billion)

Sovereign ratings: BBB / Baa3 / BBB

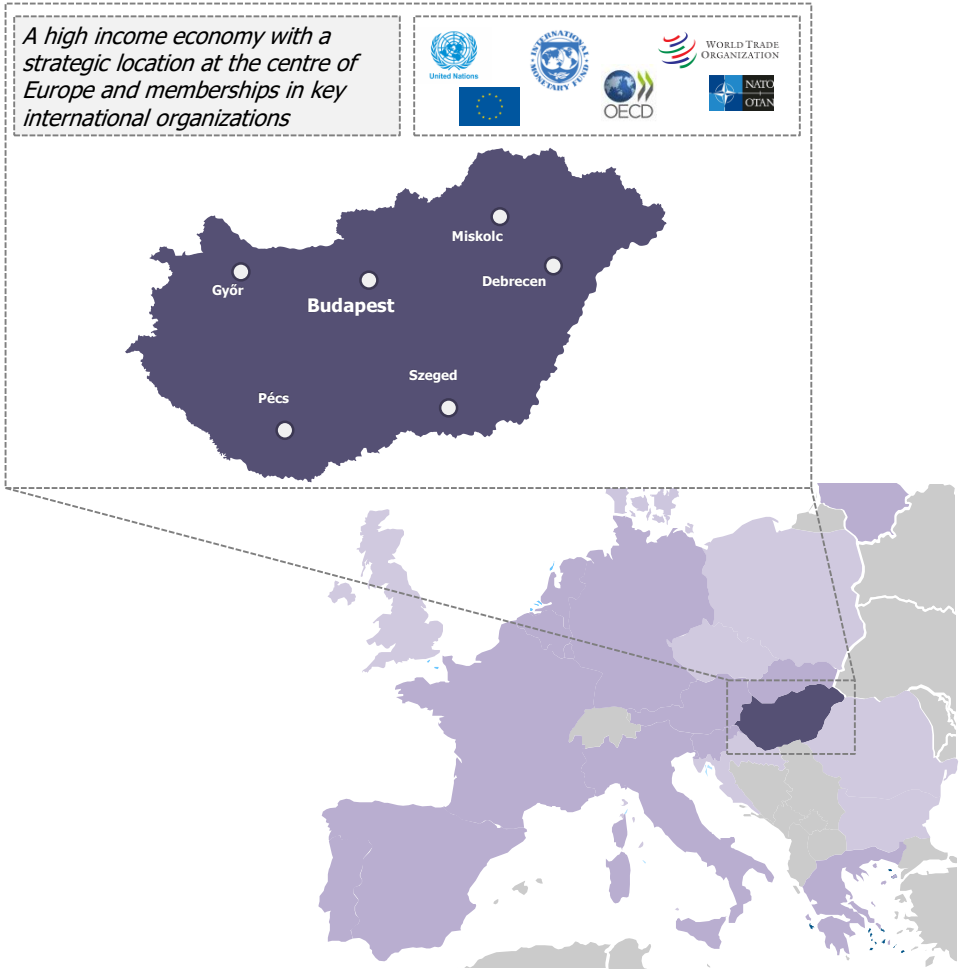
Government: parliamentary republic

EU member country since: 2004

Schengen area member since: 2007

Key economic sectors: manufacturing; wholesale and retail trade; automotive; education and health

A high income economy with a strategic location at the centre of Europe and memberships in key international organizations



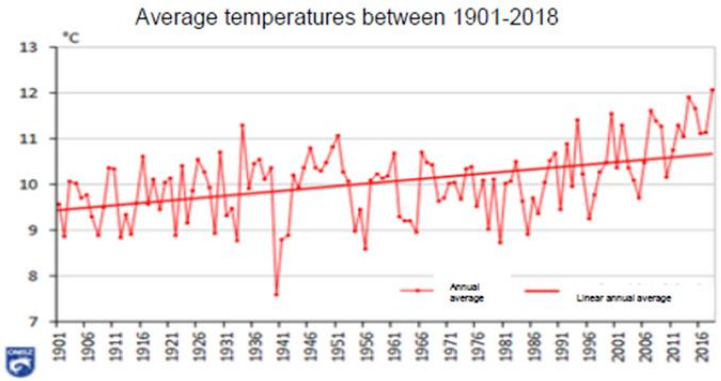
Notes: 1. Average exchange rate in 2019
Sources: Government Debt Management Agency of Hungary (AKK), Hungarian Central Statistics Office (HCSO), HIPA, Magyar Nemzeti Bank (the central bank of Hungary) (MNB), World Bank, Bloomberg, European Commission

CLIMATE CHANGE IMPACTS OBSERVED IN HUNGARY

- **Hungary is already witnessing the consequences of climate change** such as the aggravation of floods and droughts, the deterioration of arable land, water and air pollution

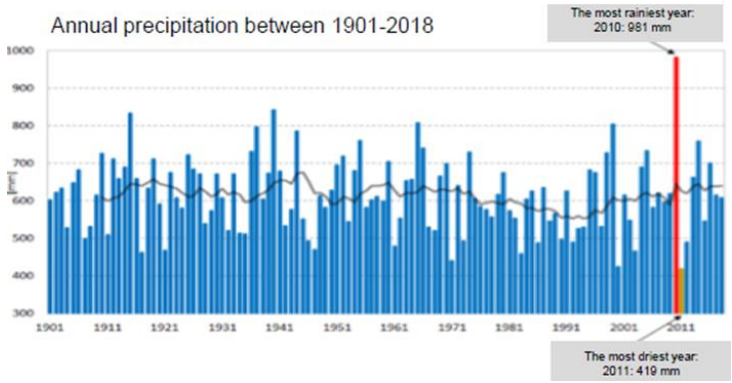
Temperatures

- Country-level **temperatures** increased 1.3°C, since the beginning of the previous century, exceeding the estimated 0.9°C of the global change.
- Between 1901-2017, the springs and summers warmed the most in Hungary, by 1.34 °C and 1.25 °C respectively. Warm temperature extremities have become more frequent in Hungary



Rain precipitation

- Changes in **precipitation** are also relevant:
  - Slight annual precipitation decrease (-4%), notably in the spring (-17%) and autumn (-11%), compared to 1901.
  - Fewer days with precipitation (-14 days since 1901)
  - Longer drier periods (+4 days)
  - The rainiest and driest years during the last 100 years were 2010 and 2011



HUNGARY'S GREEN BOND STRATEGY OVERVIEW

Rationale

- **Hungary's strong commitment to fight climate change and biodiversity loss**
  - Commitment to EU NDCs under the Paris Agreement
  - Hungary supported the EU climate neutrality target and committed to climate neutrality by 2050
- **Green Bond issues to support the government's integrated energy & climate strategy**
  - National Energy and Climate Plan and Second National Climate Change Strategy provide guidance and set tasks in the field of mitigation of GHG emission and adaptation to climate change impacts for the period of 2018-2030
- **Active contribution to the development of Sustainable Finance internationally and in Hungarian domestic capital markets**
  - National Bank of Hungary – Magyar Nemzeti Bank – gave early support to the Green Bond market by becoming the first Central Bank worldwide to set-up of a dedicated Green Bond portfolio, as an investor, in June 2019
  - Hungary is planning to issue domestic HUF-denominated Green Bonds in the future
- **Response to international investors demand for Green Bonds and further diversification of Hungary's investor base**
  - Hungary to become a regular green bond issuer in international capital markets, including Euro, Japanese Yen and Chinese Renminbi subject to market conditions

Green Bond Framework overview

- Hungary's Green Bonds will support the country's climate change & environmental commitments with proceeds dedicated to **six Eligible Green Expenditures categories**:
  1. Renewable Energy
  2. Energy Efficiency
  3. Land Use and Living Natural Resources
  4. Waste & Water Management
  5. Clean Transportation
  6. Adaptation
- **Dedicated governance** for Green Bonds thanks to Steering Committee and Inter-Governmental Working Group
- Green Bond Framework in line with the **ICMA Green Bond Principles** and best market practices

The Green Bond Principles

- **Second Party Opinion** by Cicero with Medium Green shading

°C °CICERO Shades of Green

GREEN FINANCE IN HUNGARY

Greening Hungarian Financial markets

- Ensuring adequate financing is key for developing green economy and promoting environmental sustainability
- The Hungarian green financial products include:
  - Green loans: Residential Energy Efficiency Loan Programme, a non-market-based loan-like product, is the most important one
  - Investment funds: among the products offered by domestic fund managers, there are several funds that can be considered green
- Hungarian financial market hold a huge green potential. MNB launched a consultation paper to financial market players to boost Green Finance in the Hungary
- The Sovereign Green Bond intends to catalyse the development of the local green bond market and to increase the Sustainable Finance awareness in Hungary

Magyar Nemzeti Bank leadership

- The Magyar Nemzeti Bank (MNB) announced its Green Programme on February 2019 aiming to:
  - reduce the risks associated with climate change and other environmental problems
  - expand the financing of the green economy in Hungary
- Under this programme, the MNB implements several measures to encourage the increase of environmental awareness among Hungarian financial institutions and the greening of the products. MNB's initiatives include:
  - creating a "Green Finances Award" to recognize financial institutions doing the most to reduce ecological footprint
  - launching a separate green bond portfolio (as one of the first central banks to do so)
  - joining the Advisory Council of the Energy Efficient Mortgages Pilot Scheme
  - co-organising the International Green Finance Conference in Budapest
  - potential introduction of a green preferential capital requirement programme for green housing loans

I. HUNGARY CLIMATE CHANGE AND ENVIRONMENTAL STRATEGY

A BROAD COMMITMENT TO COMBAT CLIMATE CHANGE

United Nations Framework Convention on Climate Change

Clean Energy Package, European Green Deal

Scientific evidence on climate change impacts on the Carpathian Basin

Public survey and consultations on preferences for climate protection

Note: Climate change impact on the Carpathian Basin detailed on the report Jelentés az éghajlatváltozás Kárpát-medencére gyakorolt esetleges hatásainak tudományos értékeléséről available here

ECONOMIC DEVELOPMENT AND COMBATING CLIMATE CHANGE ARE MUTUALLY REINFORCING OBJECTIVES

- Energy and climate strategy is about to support high-tech and green economic development

Basic principles

Balance
- Combating climate change
- Competitiveness
- Security of supply

Cost effectiveness
- GDP convergence
- Underdeveloped regions

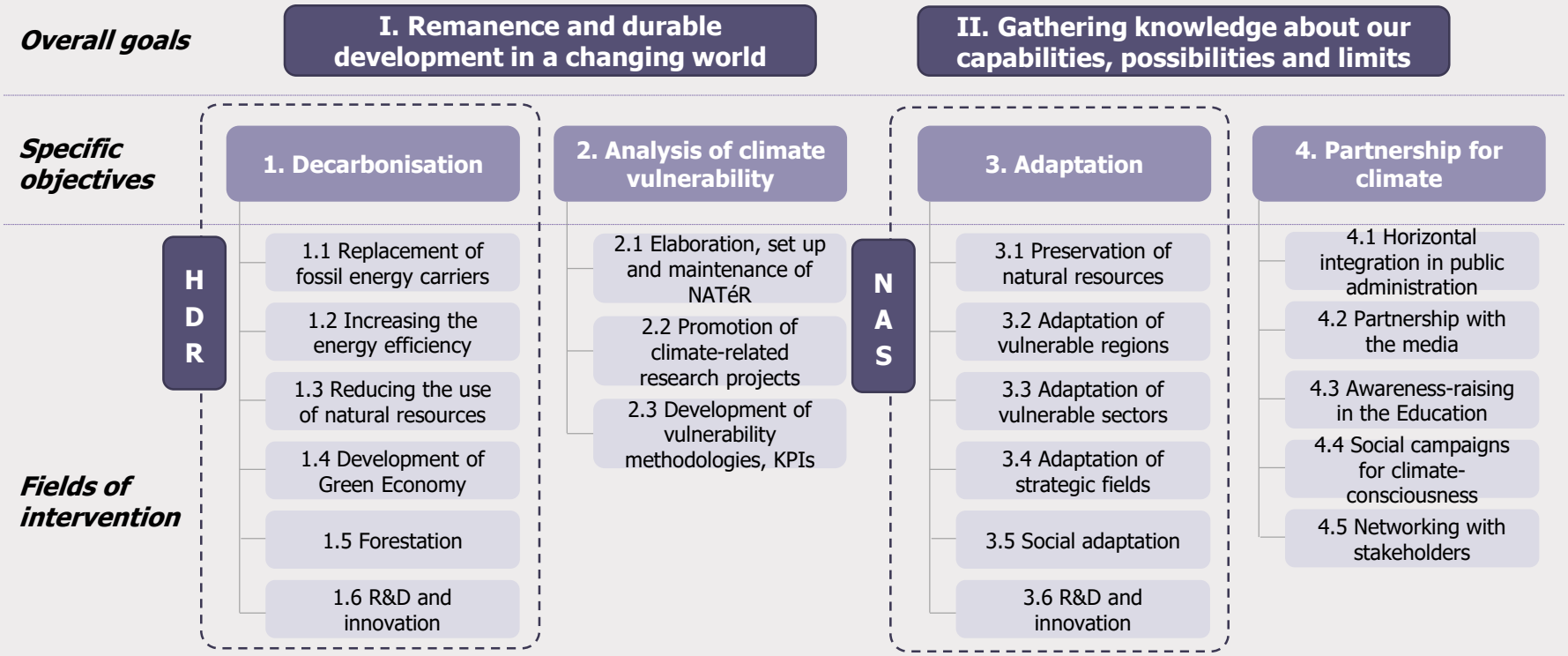
Importance of additional benefits
- Decreasing import dependency
- Affordable prices
- Innovative economic development

Technology neutrality
- Energy efficiency measures
- RES utilization
- Maintenance of nuclear capacities

Fair transition
- No one is left behind

A CLEAR AND COMPREHENSIVE ROADMAP AND STRATEGY

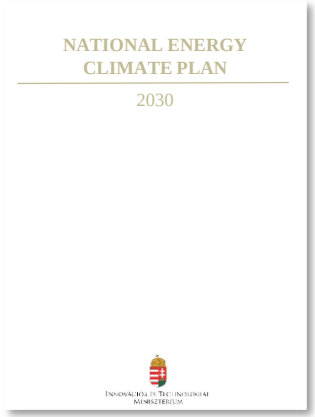
- 2nd National Climate Change Strategy provides comprehensive framework of policies on climate and green economy development. Implementation via Climate and Environmental Protection Action Plan
- Important role of coordination of all the other sectoral strategies thanks to Hungarian Decarbonisation Roadmap ("HDR") & National Adaptation Strategy ("NAS")



Sources: "Second National Climate Change Strategy for the period between 2018 and 2030 and providing and outlook until 2050"-Annex to Parliament Decision No. 23/2018. (X.31.)

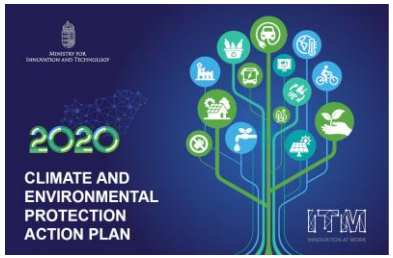
AN UP-TO-DATE SET OF LEGISLATION AND STRATEGIES

National Energy Strategy



- Complementary strategic documents, elaborated in parallel and released in January 2020:
  - NES 2030 (with an outlook to 2040) targets reduction of fossil energy imports
  - NECP defines the path to meet EU 2030 climate and GHG emissions reductions commitments
- Based upon the conclusions of an administrative and social debate

Action Plan on Climate and Nature Conservation



- Presented in Feb 2020 by MoIT
- Eight concrete measures to achieve three climate objectives:
  1. contribute to the reduction of harmful substance emissions
  2. serve to adapt to climate change, and
  3. play a part in shaping mentality

National Water Strategy 2030

- Avoid water crisis and protection of water
- Water management and safety against water damages (floods, droughts, pollution)

National Building Energy Strategy

- Strategy objectives include:
  - harmonisation with the energy and environmental objectives of the EU,
  - modernisation of buildings,
  - reducing energy poverty and
  - reducing GHG emissions
- Adopted in 2015 (Long-term renovation strategy likely to be adopted during summer 2020)

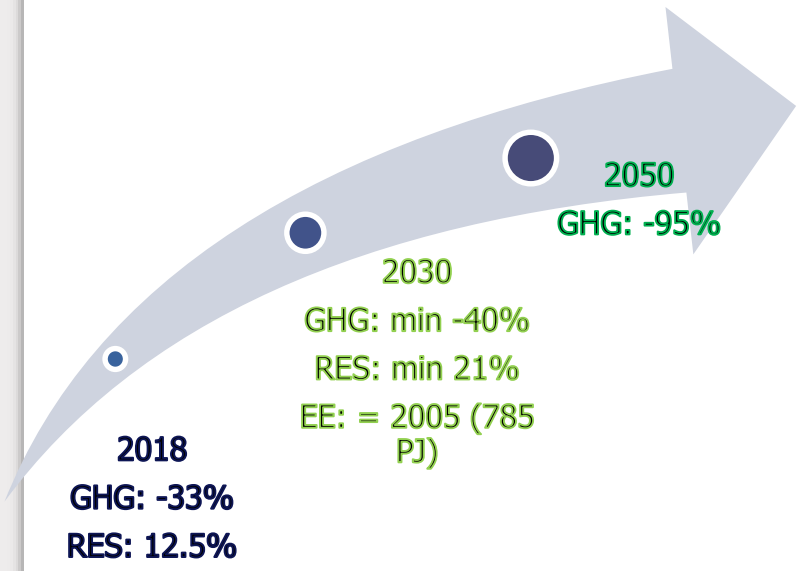
National Biodiversity Strategy 2015 - 2020

- Sets objectives for:
  - protection of areas and species,
  - maintenance of landscape diversity,
  - green infrastructure and ecosystem services,
  - agriculture, sustainable forest management,
  - protection of water resources,
  - invasive alien species.

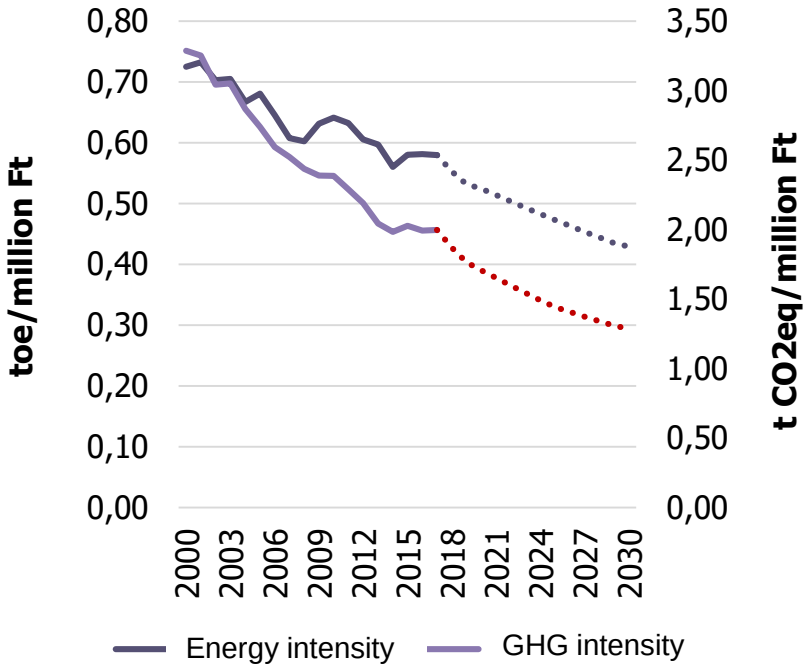
Notes: National Energy Strategy (NES) 2030, adopted in 2011, revised in 2020; National Energy and Climate Plan (NECP) 2030, adopted in 2020; Action Plan on Climate and Nature Conservation adopted in 2020
National Water Strategy 2030 adopted in 2017 ; National Building Energy Strategy adopted in 2015; National Biodiversity Strategy adopted in 2015

2030 AND 2050 ENERGY AND CLIMATE OBJECTIVES

Major energy and climate objectives for Hungary



Energy and GHG intensity of Hungary in GDP terms



Improved intensity indicators in 2019:

- 4.9% increase of GDP
- 0.9% decrease of GHG emission

Notes: GHG: Greenhouse Gases; RES: Renewable Energy Sources; EE: Energy Efficiency

FLAGSHIP PROJECTS OF THE NEW NATIONAL ENERGY STRATEGY

Reduction of GHG emission	• Carbon-free and flexible electricity production • Improvement of energy efficiency of our economy • Greening transport • Energy-conscious and modern Hungarian homes • Innovative projects in the energy sector
Adaptation to climate change	• Climate-conscious water management • Dealing with negative health impacts of climate change • Implementation of local governmental-level programs for combating climate change • Increasing the resilience of critical utility infrastructures to extreme climate events • Nature conservation in the context of climate policy

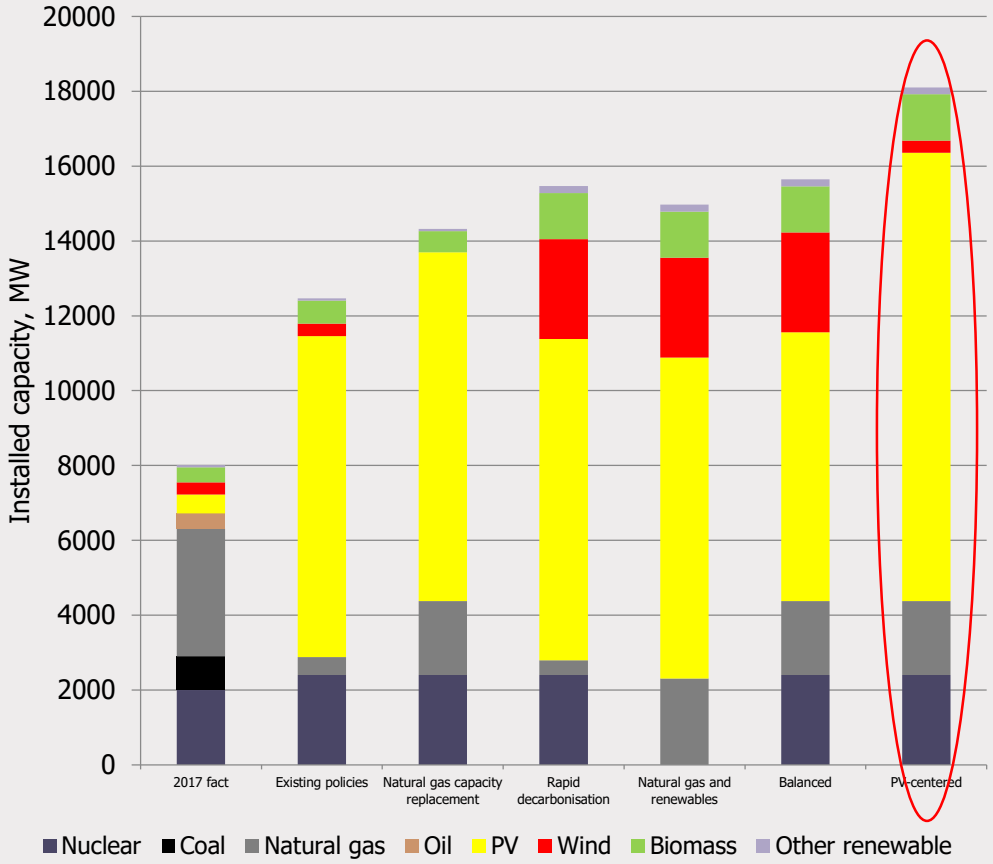
CLEAR PATHWAY TO REACH HUNGARY'S COMMITMENTS

Comparison of EU and Hungarian targets for 2030

Dimensions of Energy Union	Indicators	EU targets for 2030	Hungarian targets for 2030	Recent Hungarian situation (2018)	Most important measures
Decarbonization	**Reduction of GHG emission (%) compared to 1990**	min. -40%	min. -40%	-33 %	• Climate-friendly transformation of the electricity sector • Energy efficiency obligation scheme • Greening transport
	• GHG intensity of GDP	-	continuous decrease	1.87 t CO_2eq/million HUF	
	• Reduction of GHG emission in the non-ETS sector (%) compared to 2005	min. -10%	min. -7%	-9.8%	
	Share of RES in gross final energy consumption	min. 32%	min. 21%	12.5%	• Photovoltaics (PV) • E-mobility • Green District Heating Program
Energy efficiency	**Final energy consumption**	Indicative 32.5% reduction	max. 785 PJ The source of any extra consumption can be only RES between 2030 and 2040	776 PJ	• Reduction of final consumption by 0.8% per year • Promotion of energy efficiency investments in industry

ELECTRICITY MARKET TRANSITION 2040: N°1 FLAGSHIP

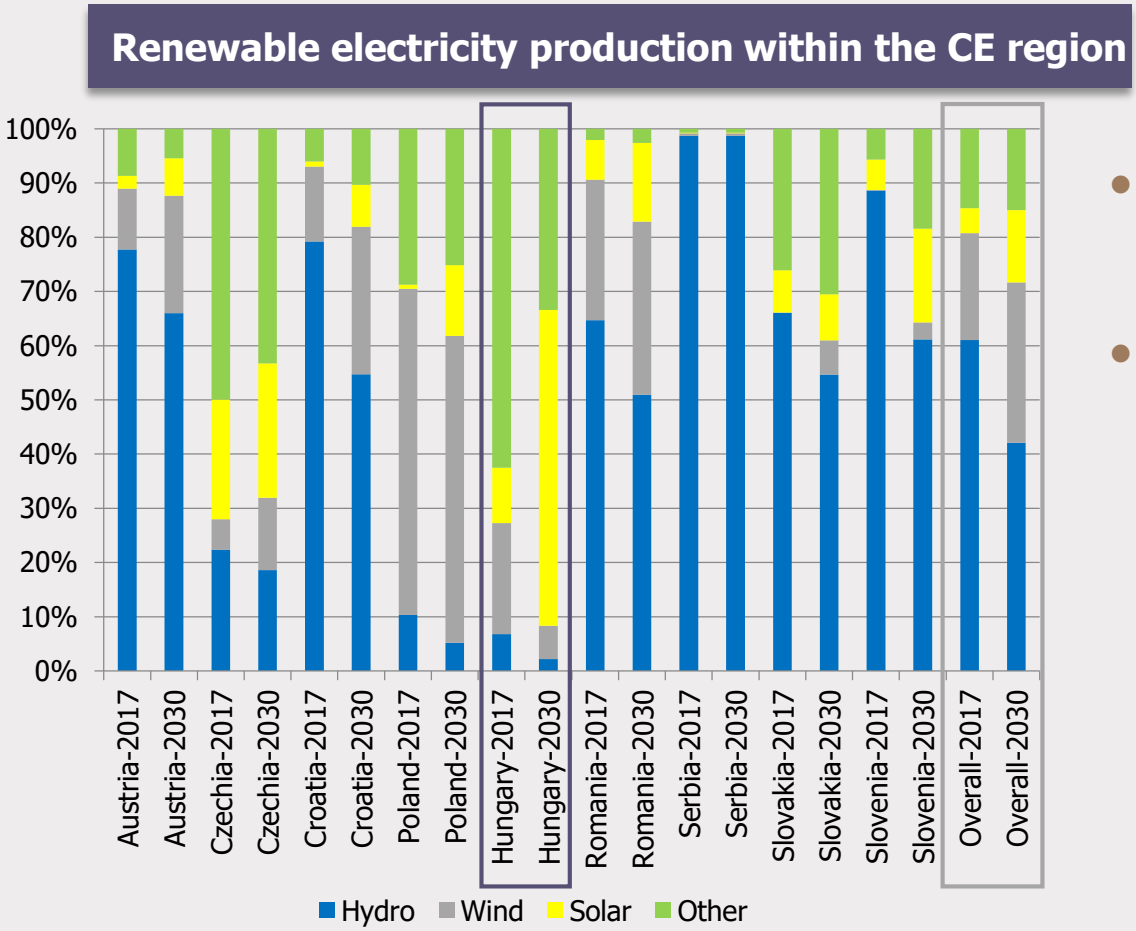
Current and 2040 fuel mix scenarios, Hungary



- Electricity transition will be based on:
  - Decarbonising the power sector: 90% in 2030 vs 60% in 2020
  - Maintaining nuclear capacity
  - Phasing out lignite
  - Solar-heavy RES-E portfolio: 6.6 GW by 2030; 12 GW by 2040
  - Gas based generation as primary backup
  - Network development
  - Flexibility market
  - 1 million smart meters
  - Import ratio: 20% in 2040

Source: "Hungarian Energy and Climate Strategy" – Ministry of Innovation and Technology

HUNGARIAN RENEWABLE ELECTRICITY PORTFOLIO IN LINE WITH THE REGION



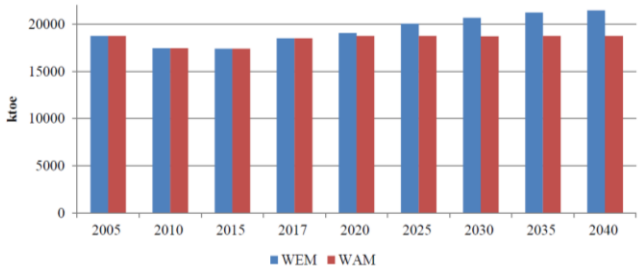
- RES-E sources: PV and biomass
  - the most cost efficient and most favorable conditions
- Fits well into the balanced regional renewable portfolio:
  - Poland: wind
  - Romania, Austria: hydro, wind
  - Balkan: hydro

Source: Eurostat, NECP of Hungary, NECP drafts

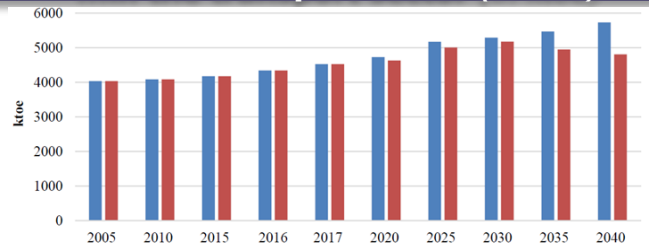
REDUCING ENERGY CONSUMPTION IS A PRIORITY

- Under Hungary's 'with additional measures' ("WAM") scenario, final energy consumption will not exceed the level of 2005 until 2030, while maintaining economic growth
- Measures to spread electric vehicles usage and reduce fuel consumption in conventional vehicles should limit the energy consumption of the transport sector
- Significantly greater energy savings are expected in the residential sector (-33% by 2030 vs 2016)
- In the meantime, final energy consumption in the tertiary/service and industrial sectors are forecasted to grow (+10% and +48% respectively by 2030 vs 2016)

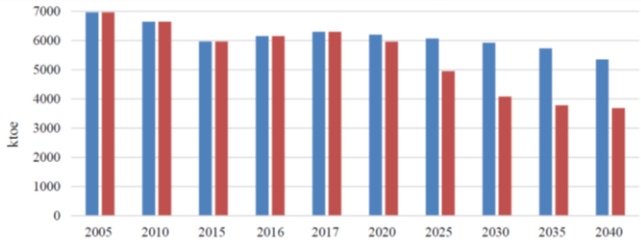
Final energy consumption *(in ktoe)*



...in the transport sector *(in ktoe)*



...and the residential building sector *(in ktoe)*

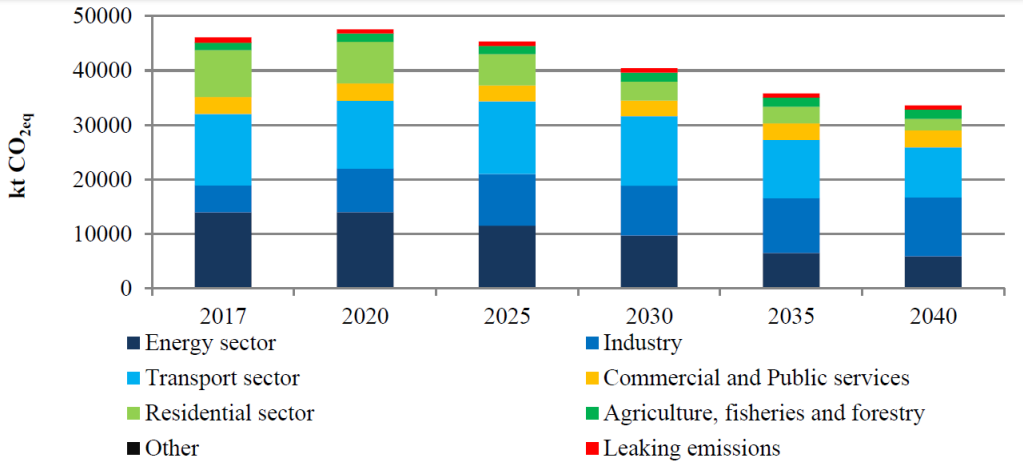


Notes: *Under EU legislation, Member States have been required to report projections scenario of anthropogenic GHG or air pollutant emissions by sources that encompass the effects of currently implemented or adopted policies and measures - "with existing measures" (WEM) and projections scenario that encompass the effects of policies and measures which have been adopted and implemented, as well as planned policies that are judged to have a realistic chance to be adopted and implemented in the future 'with additional measures' (WAM). Source: Hungarian Energy and Climate Strategy, Ministry of Innovation and Technology*

GHG EMISSION REDUCTION PATHWAY

- As part of the EU's 2030 Climate and Energy Framework, Hungary's overall GHG emissions will be reduced by 40% by 2030
- Transport sector will become the major emitter (with 31.6%) by 2030
- However, in 2040, industry's emissions will be the highest

Evolution of GHG emissions by sectors *(WAM scenario)*



Main actions

- Share of carbon-free electricity production to increase from 60% in 2018 to 90% in 2030
  - Phase out of coal-based power generation, with the restructuring of the lignite-fired "Mátra Power Plant"
  - Maintain nuclear power generation capacity
  - Renewable electricity production to increase from current 10% to 20% in 2030 and 37% in 2040; mostly PV based
- The new "greening transport" program to play a key role in the decarbonisation of the economy
- Share of renewables in district heating to increase from 20% to 50% by 2030
- Emission reductions from agriculture by various financing measures and legislation
- New waste management strategy (under development)
- Raise CO_2 sink capacities by raising the area covered by forests in line with the National Forest Strategy

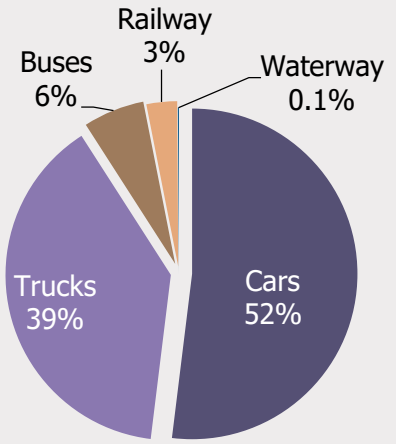
Source: Hungarian Energy and Climate Strategy, Ministry of Innovation and Technology

THE CLEAN TRANSPORTATION CHALLENGE

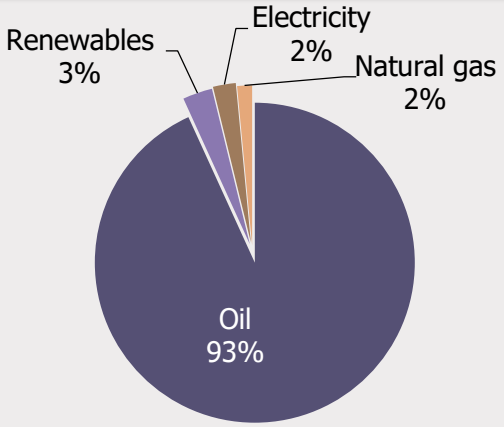
- Transport sector is responsible for 24% of Hungary's total domestic energy consumption (of which 97% from road transport)
- This economic growth-driven transport increase poses a real threat to achieving our GHG emissions reduction targets (31% GHG emissions increase between 2013 and 2017)
- Our goal is to reverse this growing trend:
  - 5% reduction of transport GHG emissions by 2030
  - Progressively replace transport fuel consumption (currently 93%) by electricity and other alternatives
  - The proportion of biofuels used in transport has increased, and expected to reach 8.2% by the end of 2020
  - In the future, we want to encourage both the use and domestic production of the so-called advanced or second-generation biofuels

Transport sector key indicators	2017	2030
Sector GHG emissions	13,143 kt CO2eq	12,485 kt CO2eq
Share of renewable energy in sector's final energy consumption	6.8%	min. 14%

Energy consumption by type of transport



Energy consumption by type of fuel



Source: Ministry of Innovation and Technology

GREENING TRANSPORT

- The implementation of the Transport Greening Program is one of the main actions of the National Energy Strategy covering four main topics:
  - Promotion of domestic developed biofuel production
  - Development of electro-mobility and alternative fuel charging infrastructure
  - Green Bus Program
  - Promotion of road-rail transport
- EU Directive on Clean procurement: the promotion of clean and energy-efficient road transport vehicles can be applied in public procurement in the Member States between 21 Aug 2021 and 31 Dec 2030

EU minimum Clean procurement targets		
Categories	Aug-21 – Dec-25	Jan-26 – Dec-30
M1, M2, N1	23.1%	23.1%
N2, N3	8%	9%
M3	37%	53%

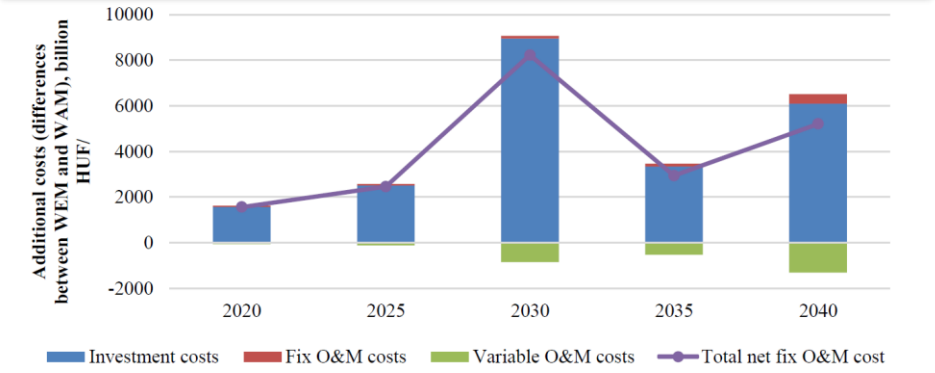
The Green Bus Program will provide a total of HUF 36 bn between 2020 and 2029 to support the purchase of 1,290 buses

Jedlik Ányos Plan 2.0 defines the 2030 strategy for electrification of road transport, promoting electric vehicles and infrastructure through regulatory, fiscal and financial support instruments

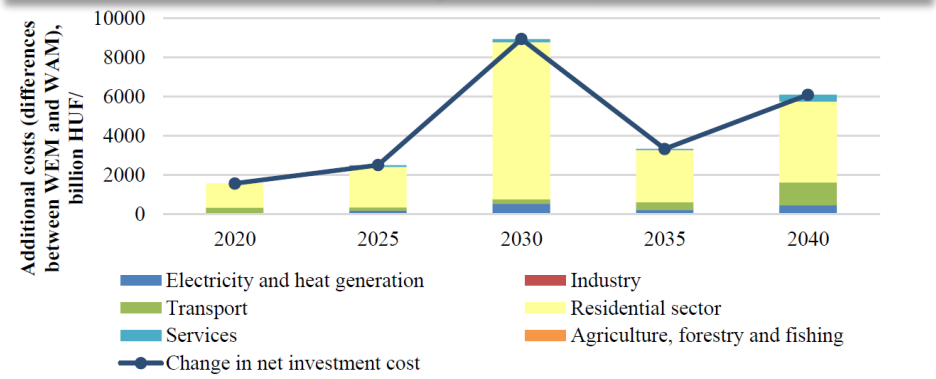
Directive (EU) 2019/1161 amending Directive 2009/33/EC - Minimum procurement targets for the share of clean light-duty vehicles in the total number of light-duty vehicles (M1, M2 and M3) and for the share of clean heavy-duty vehicles in the total number of heavy-duty vehicles (N1, N2, and N3) covered by public procurement contracts at Member State level

INVESTMENT NEEDS TO ACHIEVE HUNGARY'S TARGETS

Additional measures' implementation costs (WAM scenario)



Additional costs by sectors (WAM scenario)

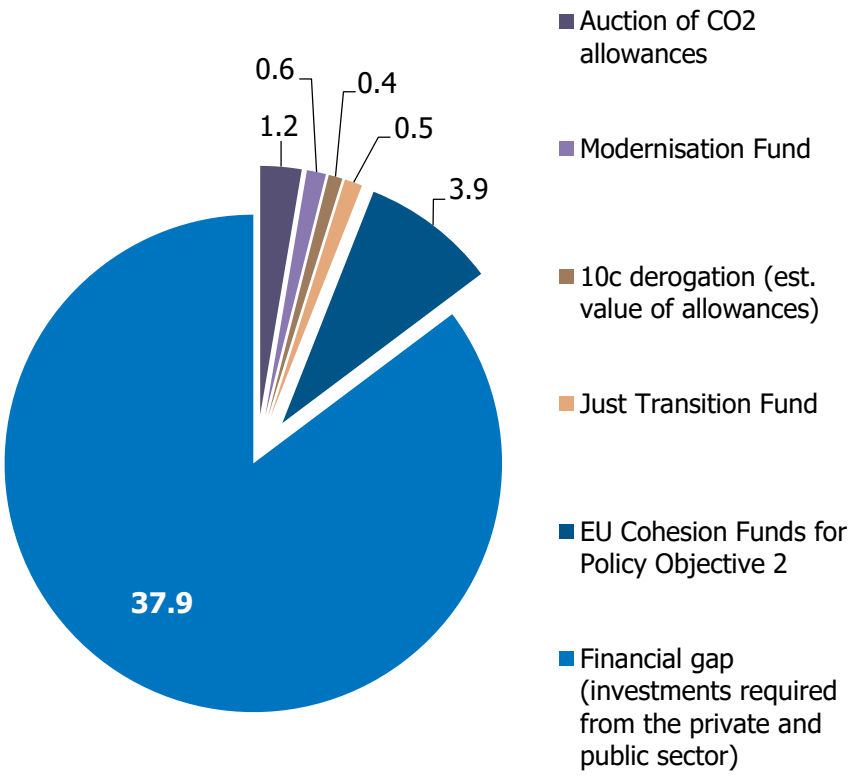


- During the last 5 years, Hungary has disbursed c. HUF 560bn (EUR 1.7bn) and will continue to expense 2 to 2.5% of its annual GDP to help meet its energy and climate targets
- Achieving Hungary's WAM scenario targets will cost c. EUR 44.5bn by 2030 and c. EUR 62bn by 2040* (excl. costs of nuclear capacity maintenance and grid development)
- The investment need is expected to be the highest between 2025 and 2030: worth waiting for the introduction of new technologies until their costs decline
- Further cost reduction can be achieved through lower operation costs of the new technologies

Additional costs from 2016 to 2030 and 2040 respectively, discounted to 2019. In the graph, each bar represent the change of the net additional cost (between WEM and WAM) during respective 5-year period.
Source: Hungarian Energy and Climate Strategy, Ministry of Innovation and Technology

FUNDING SOURCES

Available financial resources (2020-2030) and financial requirement (in EUR bn)



- A part of the funding needed for environmental projects is provided by EU funds and by the sale of CO_2 allowances in the EU ETS
- Based on the current available financial resources for 2020 to 2030, there is still an important additional financial requirement of EUR 37.9bn
- A large part will be covered by the private sector, supported by incentive schemes such as energy efficiency obligation scheme and ESCO-type solutions
- Another part is supported by the State Budget and will be partially financed by issuing Green Bonds

Source: Ministry of Innovation and Technology

II. HUNGARY'S GREEN BOND FRAMEWORK

GREEN BOND FRAMEWORK OVERVIEW

- The Green Bond Framework of Hungary is in line with the best market practices: Green Bond Principles, Japanese Ministry of Environment Green Bond Guidelines and the Guidelines on Green Note of Non-Financial Enterprise published by NAFMII
- The proposed EU Green Bond Standard by the EU TEG was also taken into consideration

Use of Proceeds	Renewable Energy	Land Use and Living Natural Resources	Clean Transportation
	Energy Efficiency	Waste & Water Management	Adaptation
Process for Expenditure Evaluation and Selection	Ministry of Finance is in charge of coordinating the process • Inter-Governmental Working Group (IWG) evaluates potential green expenditures • Steering Committee approves Eligible Green Expenditures		
Management of Proceeds	Ministry of Finance is in charge of Green Bonds proceeds management • IWG monitors the level of Eligible Green Expenditures • Steering Committee approves the proceeds allocation Eligible Green Expenditures can include expenditures from the 2 previous year, the current year and future years		
Reporting	Green Bond Report including Allocation and Impact Reporting		
External review	Second Party Opinion from CICERO Shades of Green		Allocation Reporting review

Notes: NAFMII : Chinese National Association of Financial Market Institutional Investors

GREEN BOND GOVERNANCE AND ORGANISATION

- For the governance of the Green Bond Framework, the Ministry of Finance in cooperation with the Government Debt Management Agency of Hungary ("ÁKK") has set-up a Steering Committee ("SC") and an Inter-Governmental Working Group ("IWG") composed by senior officials and representatives respectively of the following Ministries:

- Ministry of Finance (Chair)
- Ministry of Innovation and Technology
- Ministry of Agriculture
- Ministry of Interior
- ÁKK

Main responsibilities	Steering Committee	Inter-Governmental Working Group
Process for Expenditure Evaluation and Selection	- Approval of Eligible Green Expenditures	- Evaluation and selection of potential green expenditures
Management of Proceeds	- Approval of proceeds allocation	- Data collection and monitoring of Eligible Green Expenditures
Reporting	- Final validation	- Review and pre-validation

USE OF PROCEEDS (1/2)

- Eligible Green Expenditures should fall within the definition of Green Sector below:

Green Sector	Definition of Eligible Green Expenditures	Main State Operational Programmes	Contribution to UN SDGs and EU Environmental Objectives
Renewable Energy	- Solar - Wind - Geothermal (with direct emissions ≤ 100g - CO2e/kWh) - Biomass, Biogas or Biofuels (with direct emissions ≤ 100g CO2e/kWh) - Other sources such as heat-pump - Excluding waste to energy	- Competitive Central-Hungary Operative Programme - Environmental and Energy Efficiency Operative Programme	 EU Environmental Objective: 1. Climate Change Mitigation
Energy Efficiency	- Energy efficiency improvement in the public and private sector	- Environmental and Energy Efficiency Operative Programme - Warm at Home Programme - Rural Development Programme	 EU Environmental Objective: 1. Climate Change Mitigation
Land Use and Living Natural Resources	- Sustainable agriculture - Biodiversity conservation and preservation of living natural resources	- National Environmental Protection Programme - Rural Development Programme - Environmental and Energy Efficiency Operative Programme	 EU Environmental Objectives: 1. Climate Change Mitigation 6. Protection of Healthy Ecosystems

USE OF PROCEEDS (2/2)

Green Sector	Definition of Eligible Green Expenditures	Main State Operational Programmes	Contribution to UN SDGs and EU Environmental Objectives
Waste & Water Management	- Waste management - Water treatment - Water supply	- Irinyi Plan - Environmental and Energy Efficiency Operative Programme - Rural Development Programme - Local operators and NGOs support - State Reconstruction Fund for Water Utilities	 EU Environmental Objective: 3. Sustainable land use and protection of water and marine resources 4. Transition to a circular economy 5. Pollution prevention and control
Clean Transportation	- Clean transport services and modal shift towards public transportation	- Integrated Transport Operational Programme	 EU Environmental Objective: 1. Climate Change Mitigation
Adaptation	- climate change extreme weather events observation systems	- Environmental and Energy Efficiency Operative Programme - Climate change extreme weather events observation systems and support adaptation related infrastructure	 EU Environmental Objectives: 1. Climate Change Adaptation

- Eligible Green Expenditures might include:
  - Investment expenditure of State and Public bodies, agencies and companies
  - Operating expenditure of State bodies or agencies dedicated to environmental issues
  - Intervention expenditure includes transfers and subsidies to public agencies and to enterprises
  - Tax expenditure includes tax credits and tax incentives related to activities with environmental benefit

PROCESS FOR EXPENDITURE EVALUATION AND SELECTION

- The evaluation and selection of Eligible Green Expenditures is performed on an annual basis, as follows:

Process for Eligible Green Expenditures evaluation and selection	
• Steering Committee and IWG chairmanship • Coordination of identification process	Ministry of Finance
• Identification of potential green budget expenses	Each relevant ministry, and in particular: • Ministry of Finance • Ministry of Innovation and Technology • Ministry of Agriculture • Ministry of Interior
• Evaluation and selection of potential green expenditures	Inter-Governmental Working Group
• Approval of Eligible Green Expenditures	Steering Committee

MANAGEMENT OF PROCEEDS

- Eligible Green Expenditures may include expenditures:
  1. Within the 2 budget years preceding the year of issuance;
  2. Made in the same year as the issuance;
  3. Future budget expenditures
- The management of proceeds will be performed annually on a notional basis, as follows:

Process for Management of Proceeds	
• Data collection and monitoring of Eligible Green Expenditures	Inter-Governmental Working Group
• Approval of proceeds allocation	Steering Committee
• Keeping record of unallocated Green Bonds funding	Ministry of Finance

REPORTING (1/2)

- Hungary is committed to provide investors with transparent reporting:
  - on the allocation of proceeds towards Eligible Green Expenditures on an annual basis
  - on the environmental impact of those expenditures after the full allocation of the bond proceeds or more frequently as Hungary deems necessary
- The Green Bond reporting will be elaborated and validated, as it follows:

Process for Green Bond reporting	
• Coordination of reporting process	Ministry of Finance
• Data collection and Green Bond Report drafting	Each relevant ministry, and in particular: • Ministry of Finance • Ministry of Innovation and Technology • Ministry of Agriculture • Ministry of Interior
• Review and pre-validation	Inter-Governmental Working Group
• External review	CICERO Shades of Green
• Final validation	Steering Committee

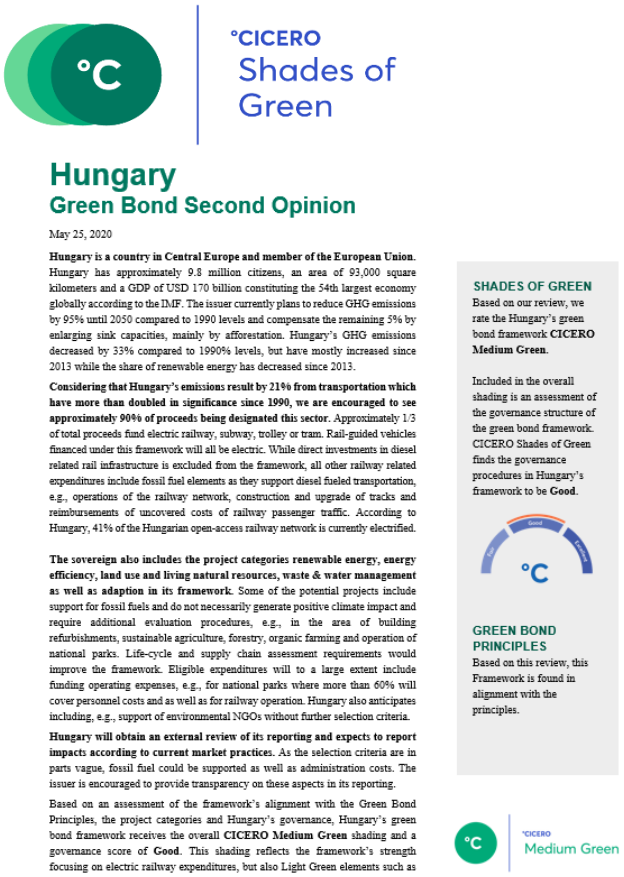
REPORTING (2/2)

- The Impact Report will provide information on the impact of Eligible Green Expenditures and their contribution to at least one of six EU Environmental Objectives
- Examples of potential key environmental impact indicators include:

Impact reporting indicators		
Eligible Green Expenditures	**Output indicators**	**Environmental impact indicators**
Renewable Energy	# of projects Total renewable energy capacity (in MW)	- Annual energy production (in MWh) - Annual GHG emission avoidance (in CO_2 equivalent)
Energy Efficiency	# of applications # and nature of beneficiaries # of building subject to energy performance improvements	- Annual energy savings (in MWh) - Annual Greenhouse Gas emission avoidance (in CO_2 equivalent)
Land Use and Living Natural Resources	# of Natura 2000 sites Hectares of sustainable forest Hectares and share of protected areas	-
Waste & Water Management	Water networks efficiency rate Rate of water network leakage Amount of waste diverted from landfill	- Water exploitation index - Status of waters
Clean Transportation	KM of new public transport lines created / maintained Number of people in new environmentally friendly means of transportation	- Annual energy savings (in MWh) - Annual GHG emission avoidance (in tonnes of eq. CO_2 per passenger/tonne-km)
Pollution Prevention and Control	# of polluted sites under remediation # and nature of ecological monitoring projects	-
Adaptation	# and nature of projects supporting adaptation	-

EXTERNAL REVIEW PRE- AND POST-ISSUANCE

- Green Bond Framework pre-issuance verification:
  - Hungary has engaged CICERO Shades of Green to provide an independent Second Party Opinion on this Green Bond Framework
  - Hungary's Green Bond Framework was rated "Medium Green" and "Good" on Governance
- Allocation Reporting post-issuance review:
  - Hungary will engage an independent third party to review the Allocation Reporting and its conformity with this Green Bond Framework
  - The initial Allocation Reporting review is expected to be provided by CICERO Shades of Green
  - This process will be made on an annual basis until full allocation



°CICERO Shades of Green

Hungary
Green Bond Second Opinion

May 25, 2020

Hungary is a country in Central Europe and member of the European Union. Hungary has approximately 9.8 million citizens, an area of 93,000 square kilometers and a GDP of USD 170 billion constituting the 54th largest economy globally according to the IMF. The issuer currently plans to reduce GHG emissions by 95% until 2050 compared to 1990 levels and compensate the remaining 5% by enlarging sink capacities, mainly by afforestation. Hungary's GHG emissions decreased by 33% compared to 1990% levels, but have mostly increased since 2013 while the share of renewable energy has decreased since 2013.

Considering that Hungary's emissions result by 21% from transportation which have more than doubled in significance since 1990, we are encouraged to see approximately 90% of proceeds being designated this sector. Approximately 1/3 of total proceeds fund electric railway, subway, trolley or tram. Rail-guided vehicles financed under this framework will all be electric. While direct investments in diesel related rail infrastructure is excluded from the framework, all other railway related expenditures include fossil fuel elements as they support diesel fueled transportation, e.g., operations of the railway network, construction and upgrade of tracks and reimbursements of uncovered costs of railway passenger traffic. According to Hungary, 41% of the Hungarian open-access railway network is currently electrified.

The sovereign also includes the project categories renewable energy, energy efficiency, land use and living natural resources, waste & water management as well as adaption in its framework. Some of the potential projects include support for fossil fuels and do not necessarily generate positive climate impact and require additional evaluation procedures, e.g., in the area of building refurbishments, sustainable agriculture, forestry, organic farming and operation of national parks. Life-cycle and supply chain assessment requirements would improve the framework. Eligible expenditures will to a large extent include funding operating expenses, e.g., for national parks where more than 60% will cover personnel costs and as well as for railway operation. Hungary also anticipates including, e.g., support of environmental NGOs without further selection criteria.

Hungary will obtain an external review of its reporting and expects to report impacts according to current market practices. As the selection criteria are in parts vague, fossil fuel could be supported as well as administration costs. The issuer is encouraged to provide transparency on these aspects in its reporting.

Based on an assessment of the framework's alignment with the Green Bond Principles, the project categories and Hungary's governance, Hungary's green bond framework receives the overall **CICERO Medium Green** shading and a governance score of **Good**. This shading reflects the framework's strength focusing on electric railway expenditures, but also Light Green elements such as

SHADES OF GREEN
Based on our review, we rate the Hungary's green bond framework **CICERO Medium Green**.

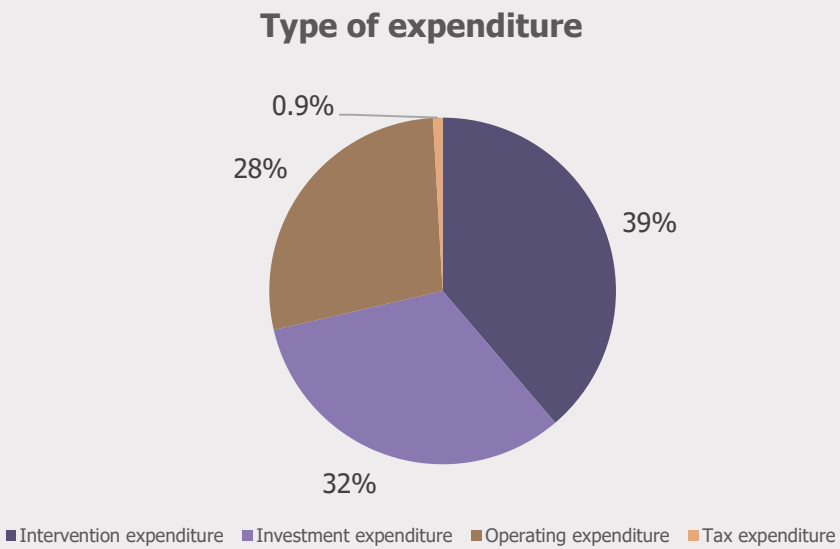
Included in the overall shading is an assessment of the governance structure of the green bond framework. CICERO Shades of Green finds the governance procedures in Hungary's framework to be **Good**.

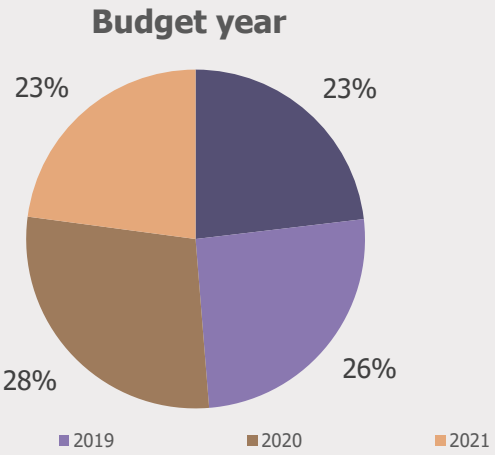
GREEN BOND PRINCIPLES
Based on this review, this Framework is found in alignment with the principles.

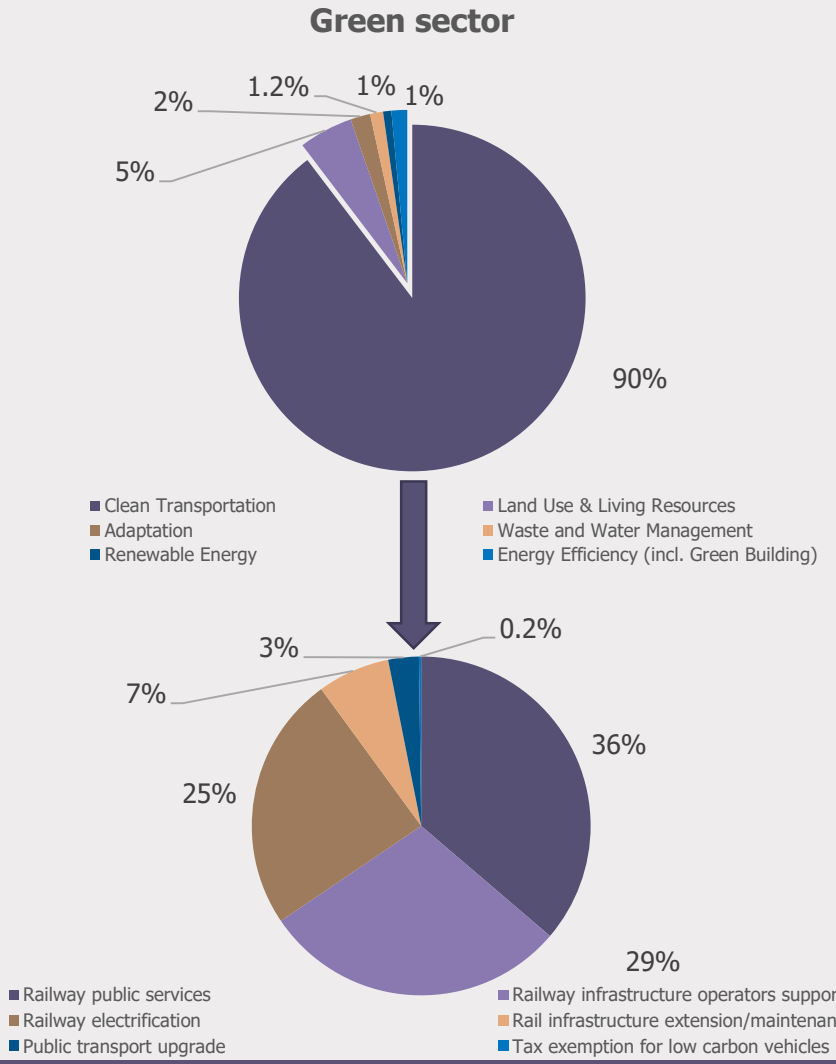
°CICERO Medium Green

III. HUNGARY'S GREEN EXPENDITURES

BREAKDOWN OF CURRENT ELIGIBLE GREEN EXPENDITURES







GREEN INVESTMENTS & STATE BUDGET EXPENDITURES

	Annual investment	Main funding sources	Key projects in Eligible Green Expenditures	Eligible Green Expenditures (2018-2021*)
Renewable Energy	0.3% of GDP	EU funding, CO_2 allowances, private sector, bank lending (including from Hungarian Development Bank) and State Budget	- Subsidies to state-owned energy company MVM - Building development with renewable energy use - Subsidies to SMEs dedicated to installation of renewable energy	HUF 12 bn
Energy Efficiency (incl. Green Building)		Private sector, bank lending and State Budget	- Subsidies to purchase energy-efficient electrical appliances (Home Warming Program) - Public building renovation - Support to farm owners and local institutions to implement energy efficiency measures - Subsidies to SMEs focusing on energy efficiency solutions	HUF 23 bn
Land Use & Living Resources	-	State Budget and EU funding	- Forest management - National Parks - Nature conservation institutions - Rural Development Program (organic farming, Natura 2000 and Water Framework Directive payments, etc) - Sustainable fishing	HUF 79 bn
Waste and Water Management	-	State Budget and EU funding	- Ecological monitoring of Szigetköz - State Reconstruction Fund for Water Utilities - Support for waste management industry development - Environmental remediation of the polluted sites - Subsidies to individual farm owners to increase water efficiency - Subsidies to technology development in waste management - Support to water and waste management services	HUF 19 bn
Clean Transportation	0.7% of GDP	State Budget and EU funding	- Railway public services - Public transport upgrade - Rail infrastructure extension or maintenance projects - Railway electrification projects - Railway infrastructure operators support - Tax exemption for electric and plug-in hybrid vehicles	HUF 1 404 bn
Adaptation	0.01% of GDP	State Budget and EU funding	- Hungarian Meteorological Service - Monitoring water resource and flow conditions facing climate change (e.g. Mosoni-Danube, Lake Balaton)	HUF 29 bn
			Total	**HUF 1 566 bn EUR 4.5 bn**

*Notes: *Indicative numbers only. Current Eligible Green Expenditures include 2018-2020 State Budget years as well as 2021 State Budget forecast. Note that 2021 State Budget has not yet been voted.*

KEY PROJECT: RENEWABLE ENERGY

Construction of Felsőzsolca Solar Power Plant, the largest capacity solar in Hungary

- Description: Felsőzsolca Solar Power Plant is the largest capacity solar power plant in Hungary. Located at Felsőzsolca, the project counts with nearly 74,000 polycrystalline solar panels installed and was concluded in November 2018.
- The project was implemented under the direction of the MVM Group engaged in renewable energy generation. The total investment was of HUF 9 billion (35% co-financed by EU funds)
- The Felsőzsolca Solar Power Plant is the first facility out of 110 solar units to be developed and constructed by the MVM Group in the country.
- Type of expenditure financed: investment
- State Programme supported: KEHOP
- Outputs and impact indicators:
  - Installed capacity: 20 MW
  - Annual energy production: 21 GWh, which corresponds to the annual electricity consumption of ~ 10,000 households
  - Annual GHG emission avoidance: 20,000 tonnes of CO_2eq.

Source: Ministry of Innovation and Technology

KEY PROJECT: ENERGY EFFICIENCY

Energy efficiency improvements in ELTE University

- Description of the project: 15 buildings of Eötvös Loránd University were renovated. The energy efficiency works of one hundred thousand square meters, included thermal insulation, replacement of external doors and windows and upgrade of boilers and heating systems. Solar panels have also been installed in the university buildings. The total investment was of HUF 5 billion (97% co-financed by EU funds)
- Type of expenditure financed: investment
- State Programme supported: KEHOP
- Outputs and impact indicators:
  - Annual energy savings: 16 990 MWh/year , equivalent to HUF 300 million
  - Annual GHG emission avoidance: 4,600 tonnes of CO_2 equivalent

Source: Ministry of Innovation and Technology

KEY PROJECT: LAND USE AND LIVING NATURAL RESOURCES

Implementation of EU Biodiversity Strategy to 2020

- Description of the project:
  - Sub-project 1 - NATURA:

Field surveys targeting wild species and natural habitats in order to reduce data deficiencies and better define the conservation status of species and habitats of community interest

  - Sub-project 2 - ECOSYSTEM SERVICES:

Mapping and assessment of ecosystems and the socio-economic evaluation of selected key ecosystem services at the national scale

  - Sub-project 3 - LANDSCAPE CHARACTER:

Developing the methodology for the classification of Hungarian landscapes based on landscape character, delimitation and description of national landscape character units, defining directions of use and developing guidelines

  - Sub-project 4 - GREEN INFRASTRUCTURE:

Assessing the status of green infrastructure in Hungary, setting objectives and defining priorities of restoration, defining conflict areas, and providing a delimitation of restoration zones

The total investment was of HUF 1.07 billion (85% co-financed by EU funds)

- Type of expenditure financed: Investment
- State Programme supported: KEHOP
- Outputs indicators: maps of species' range and habitats, map of ecosystems and ecosystem status; methodologies of monitoring, of mapping and assessing ecosystems and for delimitation and protection of landscape character units; guidelines for the classification of landscape character types; priority list of ecosystem services; national GIS database of landscape character units, national GIS database of the green infrastructure network; national priorities and target areas of conservation.

Source: Ministry of Agriculture

KEY PROJECT: CLEAN TRANSPORTATION

Eletrification of the Mezőzombor-Sátoraljaújhely railway line

- Description of the project: : Electrification of 46.3 km long railway line between Mezőzombor and Sátoraljaújhely will be concluded in 2020, after two years of work. The project included the renovation of stations in order to increase passage comfort and safety.
- Part of the line between Sárospatak - Sátoraljaújhely station was also adapted to perform the flood protection function, reducing the risk of train traffic disruption caused by the flooding of the Bodrog river.
- The project was conducted by Hungarian Railways (MÁV) and National Infrastructure (NIF). The total investment was of HUF 23 billion (85% co-financed by EU).
- Type of expenditure financed: Investment
- State Programme supported: Integrated Transport Operational Programme

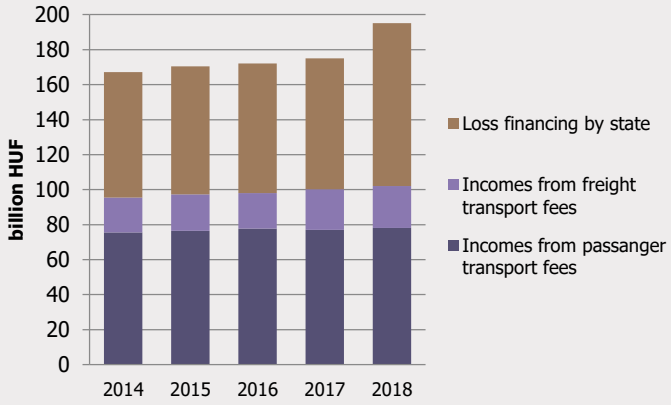
Source: Ministry of Innovation and Technology

KEY PROJECT: CLEAN TRANSPORTATION

Railway public transport support

Railway infrastructure operators support

- Length of Hungarian railway lines is 7 712 km, of which 3 000 km belongs to Trans-European network (TEN-T)
- Operation of Hungarian network is contracted between Hungarian State and 2 track operators (MAV, GYSEV) for 2016-2025
- The difference between total operation expenditures vs. incomes from network access fees is financed by Hungarian central budget



Railway public services

- Reimbursement of uncovered costs of railway passenger traffic based on EU directive
- Keeping of the high level service with frequent traffic is essential for avoiding bigger increasing of modal split reduction
- Main actions of keep and improve the financial sustainability:
  - prioritizing railway traffic at the long-distance mainlines and suburban areas
  - making the service more attractive by constant development of tracks, timetable, vehicles and further connecting services
  - improving the passenger-side facilities of ticketing by launching e-platforms for purchasing and ticket-checking

Source: Ministry of Innovation and Technology

KEY PROJECT: CLEAN TRANSPORTATION

Accelerating in electric vehicles

Tax exemption for electric and plug-in hybrid vehicles

- Description of the project: Environmentally friendly vehicles are exempt from registration tax, motor vehicles tax and motor vehicle duty
- Type of expenditure financed: tax expenditure
- State Programme supported: Jedlik Ányos Plan 2.0.

Financing Battery Electric Vehicle through tenders

- Tenders to provide financial support for purchasing electric vehicles.
- To date there have been two calls: one in 2016 with a budget of HUF 2 billion and another in 2018 with a budget of HUF 3.3 billion. The tenders have contributed to the financing of 2578 electric cars
- This investment is financed by CO_2 allowances (EU Emissions Trading System)

elektro mobilitás jövőbe vezetünk

Subsidy for electric vehicles

May 2020: announcement of a new subsidy programme for the acquisition of full electric vehicles with a value of less than 15 million forint until June 2022

Source: Ministry of Innovation and Technology

KEY PROJECT: WASTE AND WATER MANAGEMENT

Subsidies for SMEs working with waste management development

- Description of the project: the Ministry for Innovation and Technology provides subsidies to companies for the development and production of new devices and technologies for the recovery and treatment of waste, including plastic, glass, wood, metal, paper and related packaging waste, and electrical and electronic waste.
- The objective is to support a circular economy, increase efficiency, and the use of secondary raw materials in the waste sector.
- Type of expenditure financed: intervention
- State Programme supported: Irinyi Plan
- Outputs and impact indicators: number of registered patents

Source: Ministry of Innovation and Technology

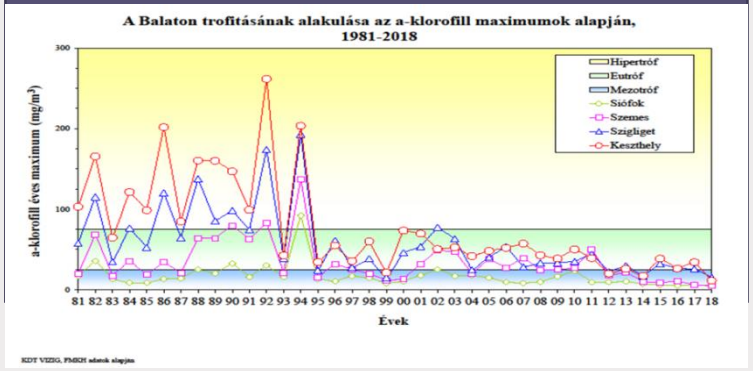
KEY PROJECT: ADAPTATION

Comprehensive environmental monitoring and information system on Lake Balaton

- Description of the project: Lake Balaton is the largest lake in Central Europe. The lake has a high degree of sensitivity to environmental and meteorological changes.
- The aim of the project is to contribute to a better understanding of the vulnerability and adaptability of the ecological and socio-economic system of Lake Balaton. Appropriate adaptation measures will also be developed by analyzing the results of the project.
- The project includes the development of a water monitoring system and the establishment of a unified information and decision support system by connecting subsystems.
- The project is implemented by the National Water Directorate General, has started in October 2017 and will be completed by October 2020. The total investment is of HUF 1 billion.
- Type of expenditure financed: Investment
- State Programme supported: KEHOP
- Outputs indicators: increasing the knowledge base on water status (more frequent and accurate information for decision – making), improved status of water

Trophic change in Lake Balaton 1981-2018

Chlorophyll-a (mg/m^3)



Source: Ministry of Interior

KEY PROJECT: ADAPTATION

Monitoring studies and developments of Water Framework Directive

- Description of the project: The project aims to develop the equipment, measurement and monitoring methods of the Hungarian monitoring system, the development of databases obtained from the performed measurements and the evaluation methods of the data in line with the requirements of the European Union (Water Framework Directive), as well as the development of future river basin management plans.
- Each element of the project can be divided into two groups: quantitative (or hydrographic) and qualitative monitoring elements. The implementation of the project has a national scope, separate target areas and investment development areas have not been delimited.
- The project has started in February 2017 and will be completed by January 2023. The total investment is of HUF 4.8 billion (85% co-financed by EU funds)
- Type of expenditure financed: investment
- State Programme supported: KEHOP
- Outputs and impact indicators: increasing the knowledge base on water status (more frequent and accurate information for decision – making), improved status of water (impact)

Source: Ministry of Interior

THANK YOU FOR YOUR ATTENTION!