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Climate Risk Summit 2019

GREEN VS. BROWN: NEW REGULATORY INITIATIVES

ESG AND SUSTAINABILITY REPORTING AND REGULATION



A diagram consisting of three light gray circles arranged vertically, connected by thin lines. The top circle is connected to the middle one, and the middle one to the bottom one. The top and bottom circles also have short lines extending from their outer edges.

Environmental anomalies as drivers of credit risk

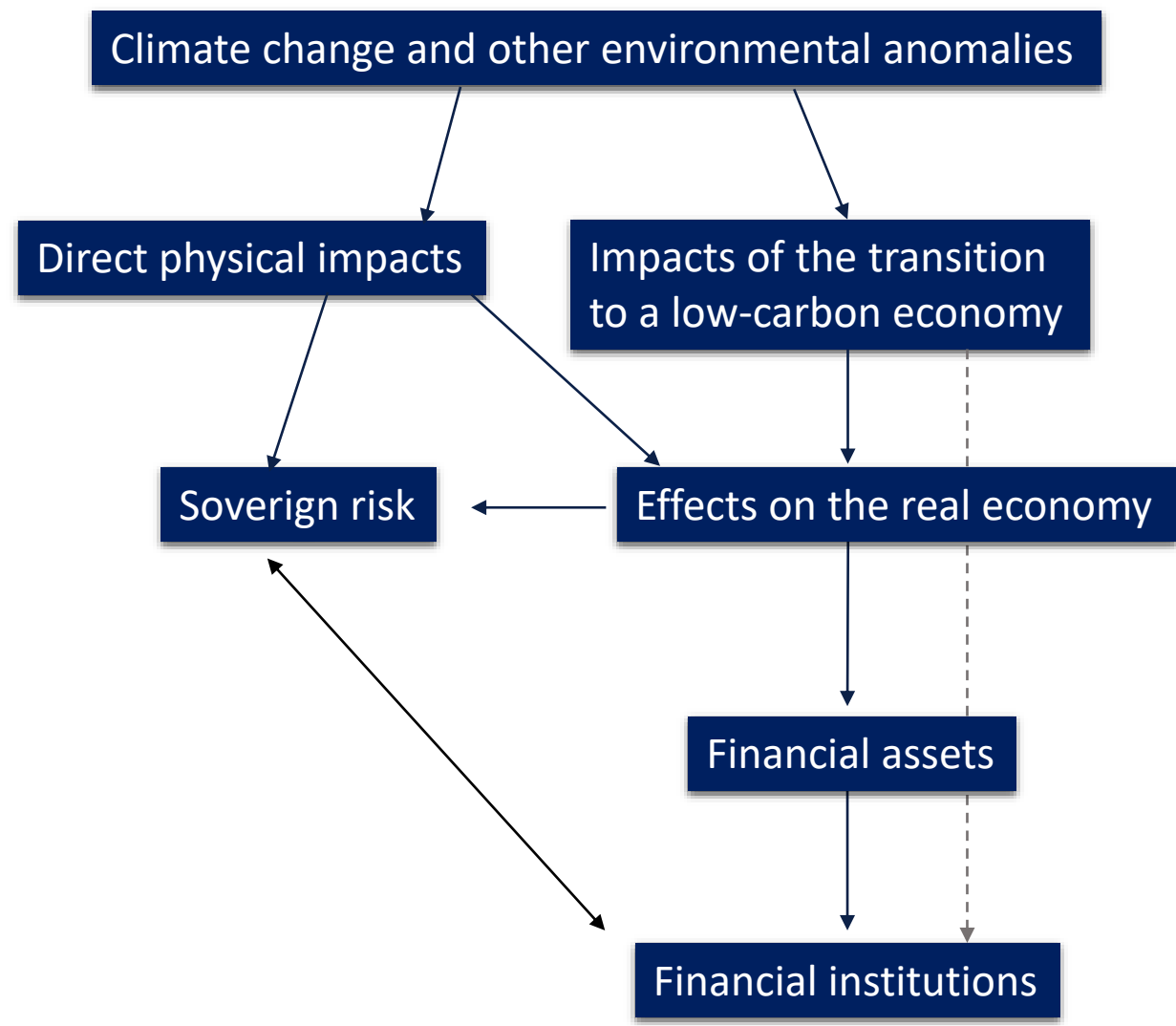
Regulatory applications of the “Green supporting factor”

Coordination with other regulatory tools and frameworks



Environmental risk as a driver of credit risk

IMPLICATIONS FOR FINANCIAL STABILITY THROUGH VARIOUS CHANNELS AND COMPLEX INTERLINKAGES

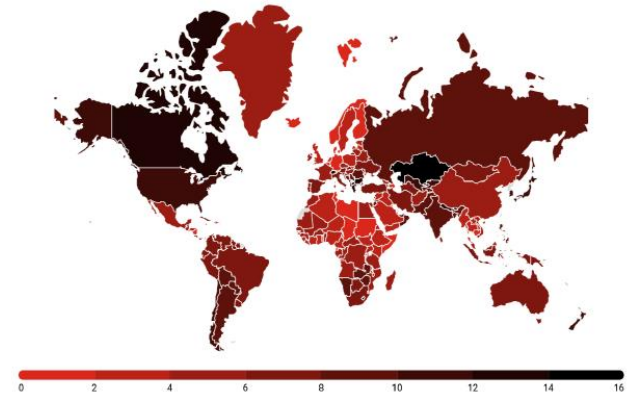


IMPROVING UNDERSTANDING OF THE IMPACTS OF ENVIRONMENTAL ANOMALIES



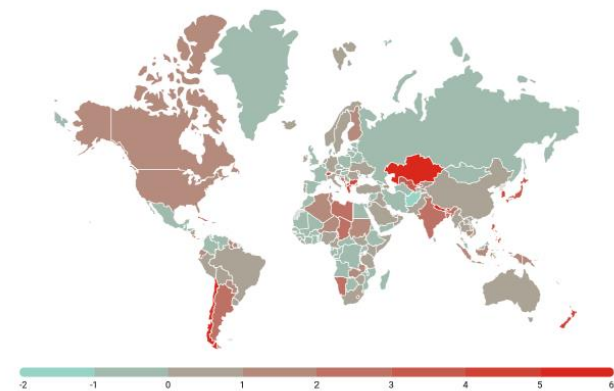
- Persistent changes in climate has long-term negative impacts on economic growth
- Negative long-run growth effects are universal (rich/poor; hot/cold).
- Paris-scenario: reduce global income by 1,07 percent by 2100.
- RCP 8.5 scenario: 7,2% GDP impact, varying significantly across countries

Percent Loss in GDP per capita by 2100 in the Absence of Climate Change Policies (RCP 8.5 Scenario)

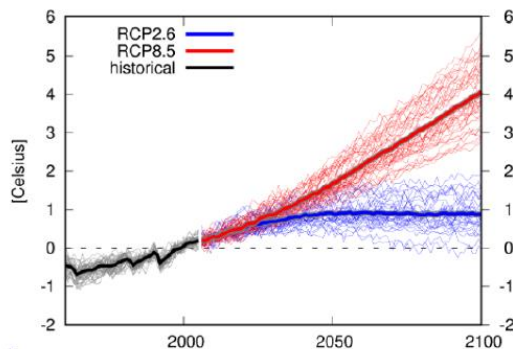


Notes: The heat map shows $\Delta_{ih}(d_i)$, see equation (31), in year 2100 with $m = 30$, based on the RCP 8.5 scenario.

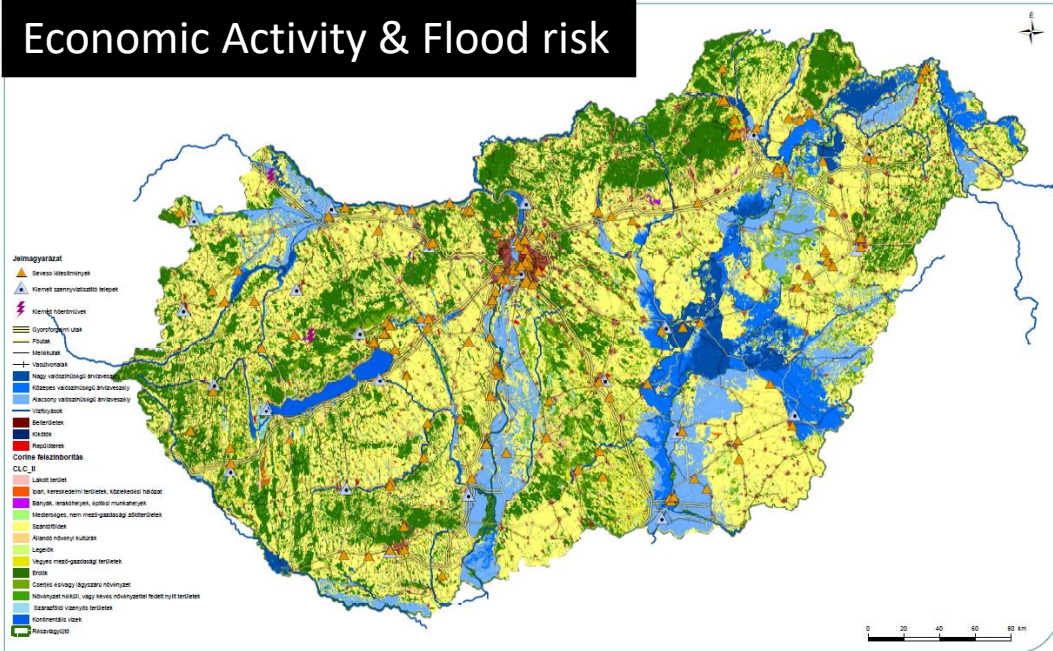
Percent Loss in GDP per capita by 2100 Abiding by the Paris Agreement (RCP 2.6 Scenario)



Notes: The heat map shows $\Delta_{ih}(d_i)$, see equation (31), in year 2100 with $m = 30$, based on the RCP 2.6 scenario.

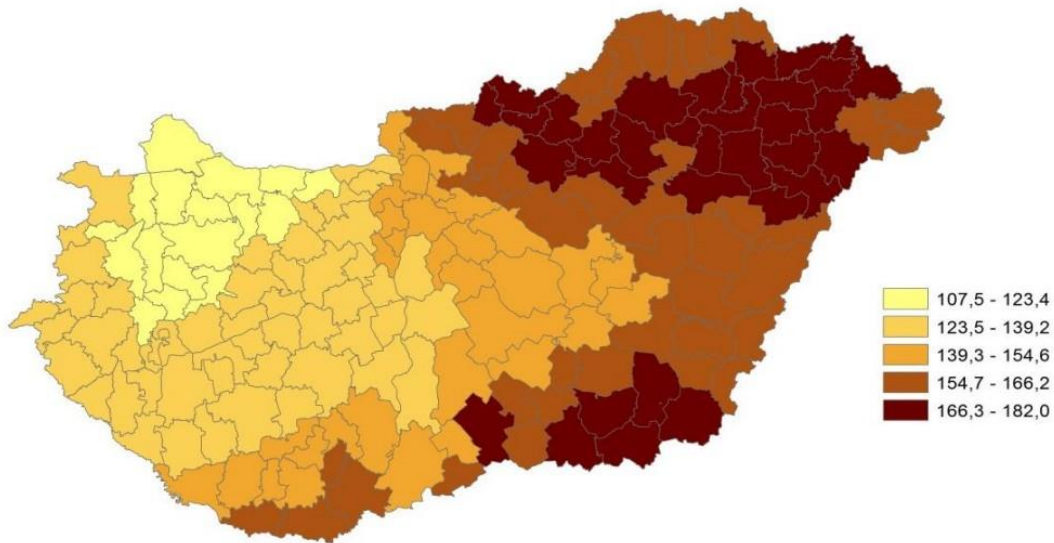


Economic Activity & Flood risk



PHYSICAL IMPACTS OF CLIMATE CHANGE

- Hungary among the most vulnerable countries in Europe
- Physical impacts like heatwaves, flashfloods, droughts fairly well understood...
- ...but real economic and transition effects less so



6 | ADDITIONAL MORTALITY DUE TO HEATWAVES, 2021-2050 -MODEL ESTIMATES COMPARED TO 1991-2020

Source: Hungarian Water Management Directorate, NATÉR



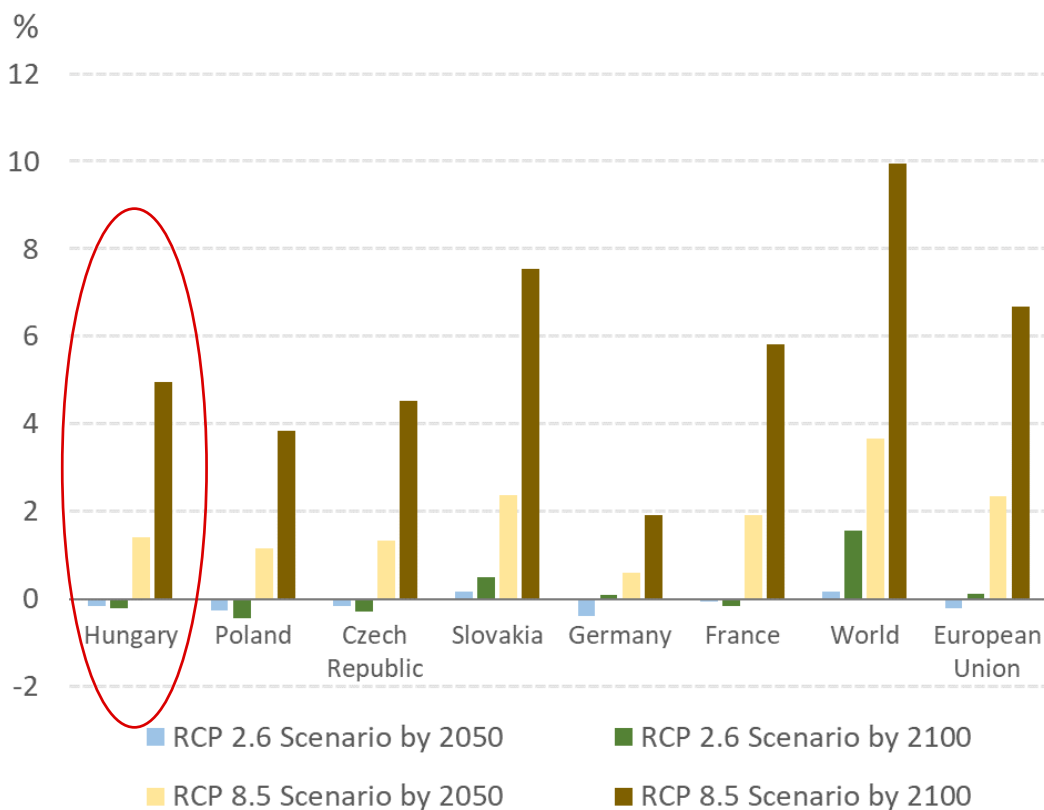
CLIMATE CHANGE'S IMPACT ON LABOUR PRODUCTIVITY

- Significant GDP losses if emissions continue to rise throughout the 21st century (RCP 8.5 scenario)
- Abiding by the Paris Climate Agreement to increase Hungarian GDP (RCP 2.6 scenario)

Note: Quoted research only focuses on the labour productivity channel and thus does not capture the total GDP impact of climate change.



Source: IMF (2019)



PERCENT LOSS IN GDP PER CAPITA BY 2050 AND 2100 UNDER THE RCP 2.6 AND 8.5 SCENARIOS

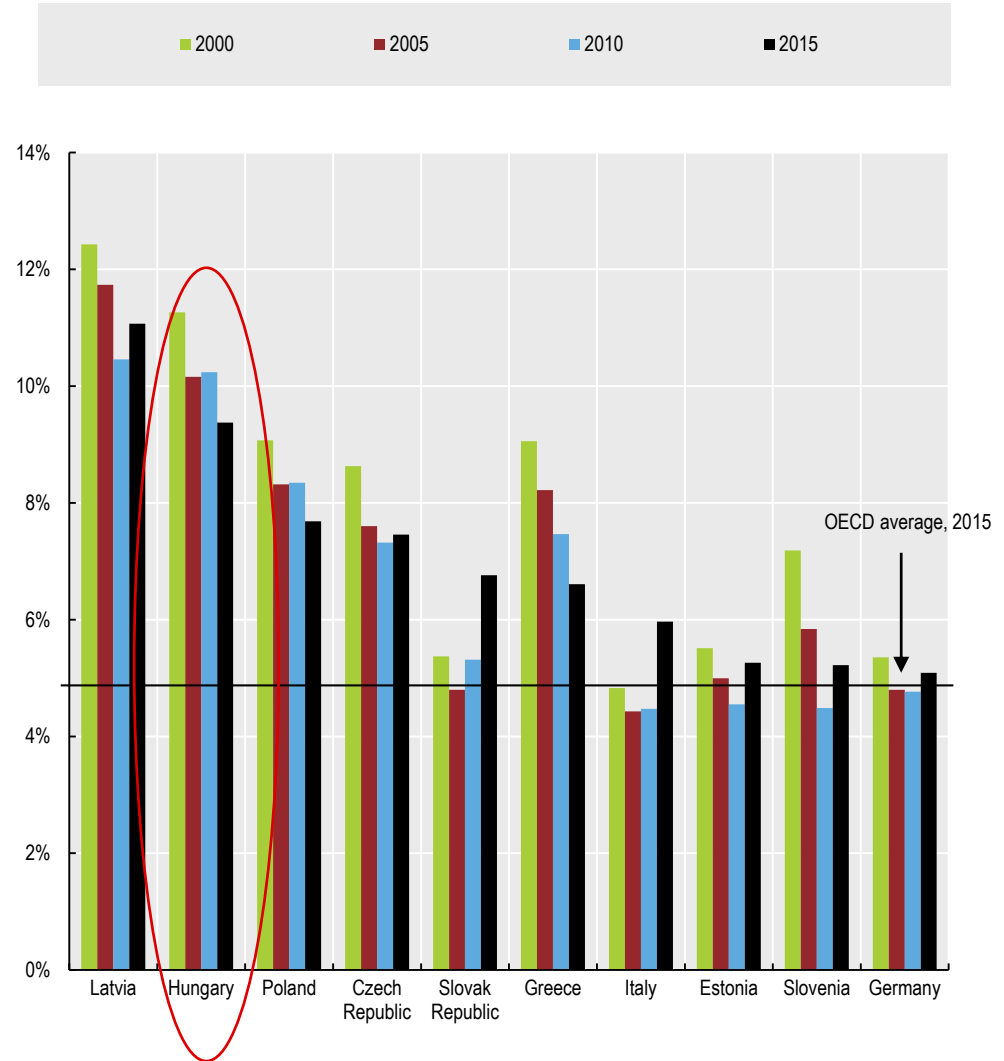
Representative Concentration Pathway (RCP) 2.6 – Paris Agreement path; RCP 8.5: unmitigated scenario

AIR QUALITY

- In 2013, the mortality rate due to air quality in Hungary was the fifth highest in the EU-28 and the highest in European countries of the OECD
- Air quality problems in Hungary might lead to an economic loss equivalent to 9% of GDP according to estimates



Source: OECD (2018), Roy, R. and N. Braathen (2017)



WELFARE COST OF PREMATURE DEATHS FROM EXPOSURE TO AMBIENT AIR POLLUTION, TOP TEN OECD COUNTRIES, 2000-15, PERCENTAGE OF GDP EQUIVALENT



Regulation on the Governance of the Energy Union and Climate Action

- By end 2019, and every ten years thereafter, each Member State shall notify to the Commission an **integrated national energy and climate plan**.
- By 1 January 2020, and subsequently every 10 years thereafter, each Member State shall prepare and submit to the Commission its **long-term strategy with a perspective of at least 30 years**. Member States should, where necessary, update those strategies every five years.

Importance of export and import channels

- Examples of car industry and carbon taxes

Consumer preferences

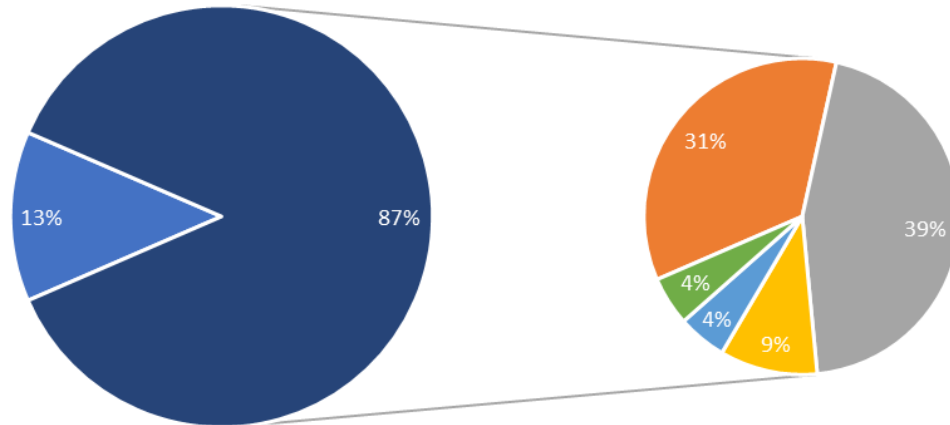
- Changing attitudes easy to track...
- ...but evidence for behavioural paradoxes

- **Urban mobility**
- **Plastics**
- **Prosumerism**
- **Digitalization**

Technological changes

- The benefits and advantages of non-linearity

HUNGARY: LITTLE AWARENESS ABOUT CLIMATE RISKS



Has your Bank identified any risks regarding climate change in your business planning horizon?

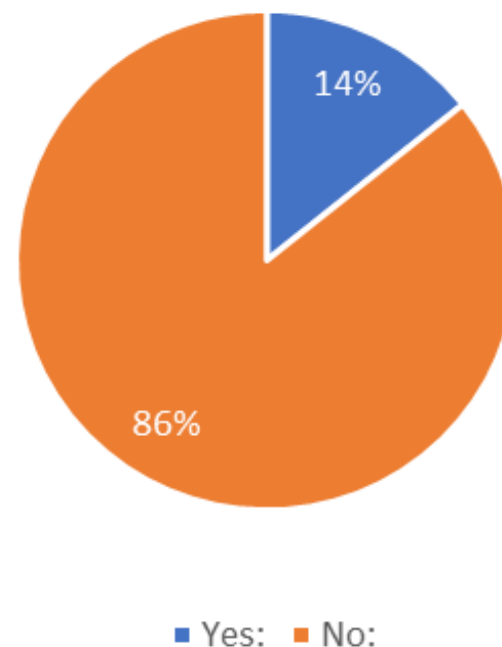
- Yes:
- No, the institution sees climate change as a relevant risk, but due to uncertainty and hardships regarding the modelling, these risks seem too hard to identify.
- No, the institution sees climate change as a risk relevant only in the long term (beyond the business planning horizon).
- No, the institution does not see climate change as a relevant risk regarding the operation of said institution.
- No, the institution sees climate change as a relevant and measurable risk, but due to lack of resources it can not be taken into account.
- No, not specified.



Source: MNB Survey (2019)

CLIMATE RISKS MAY MATERIALIZE BEYOND THE BUSINESS PLANNING HORIZON

Has your Bank evaluated the long-term effects of climate change beyond the business planning period (for the next 15-20 years)?

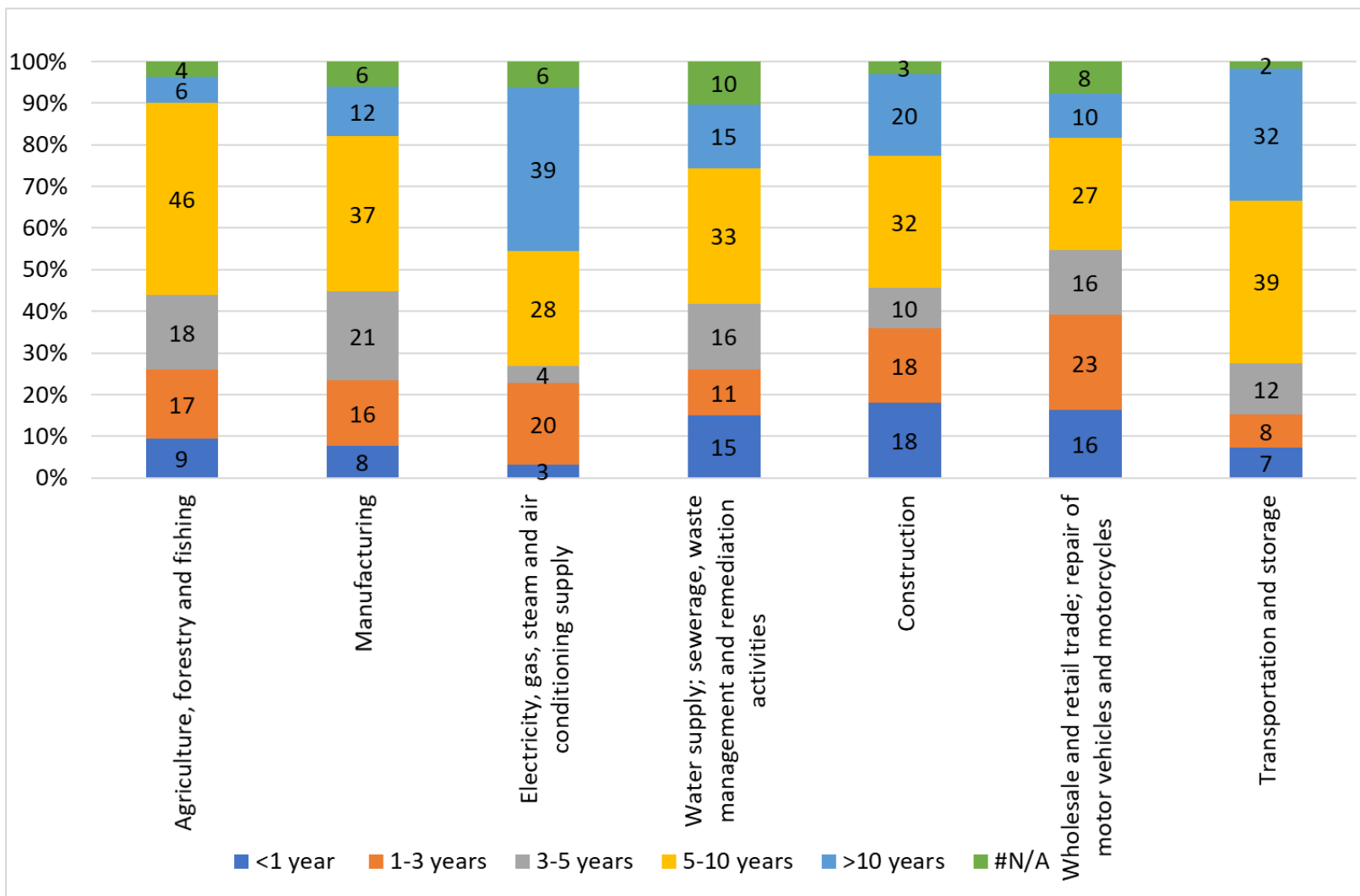


Source: MNB Survey (2019)

...WHICH MIGHT NOT BE FULLY CONSISTENT WITH LOAN BOOKS' MATURITY STRUCTURE



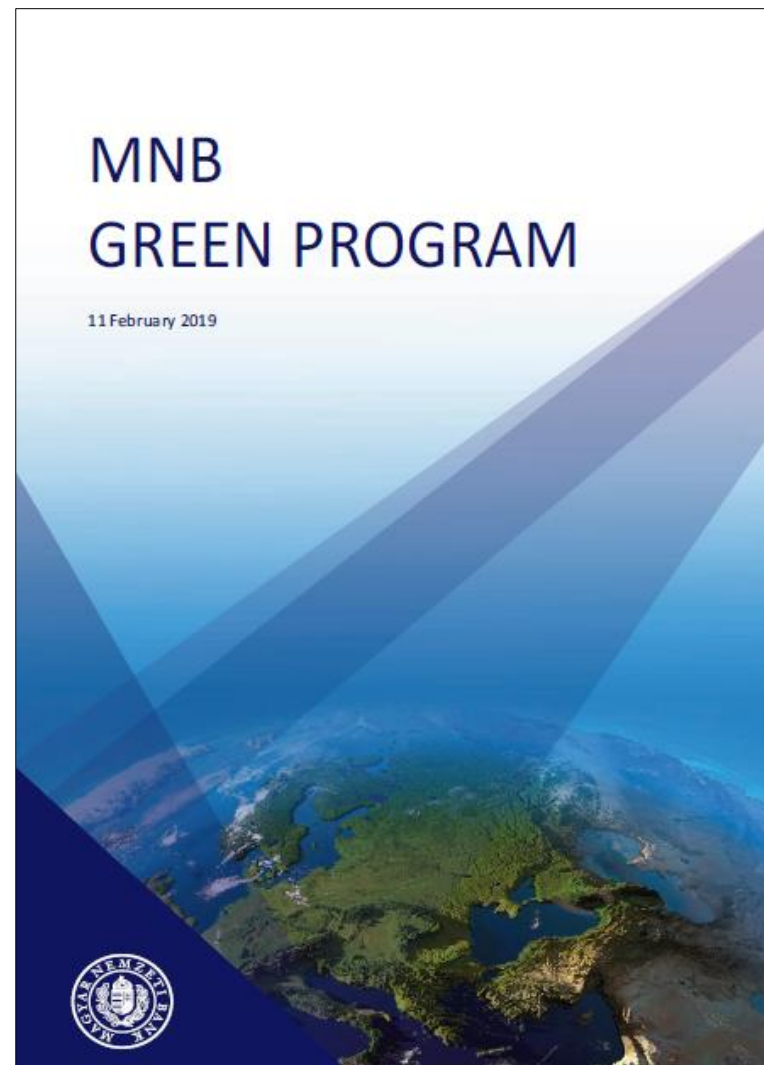
Break-down of loans in terms of original maturity in the economic sectors with highest greenhouse gas emissions



COMPREHENSIVE GREEN PROGRAM LAUNCHED EARLY 2019

Gradually built up policy
measures to

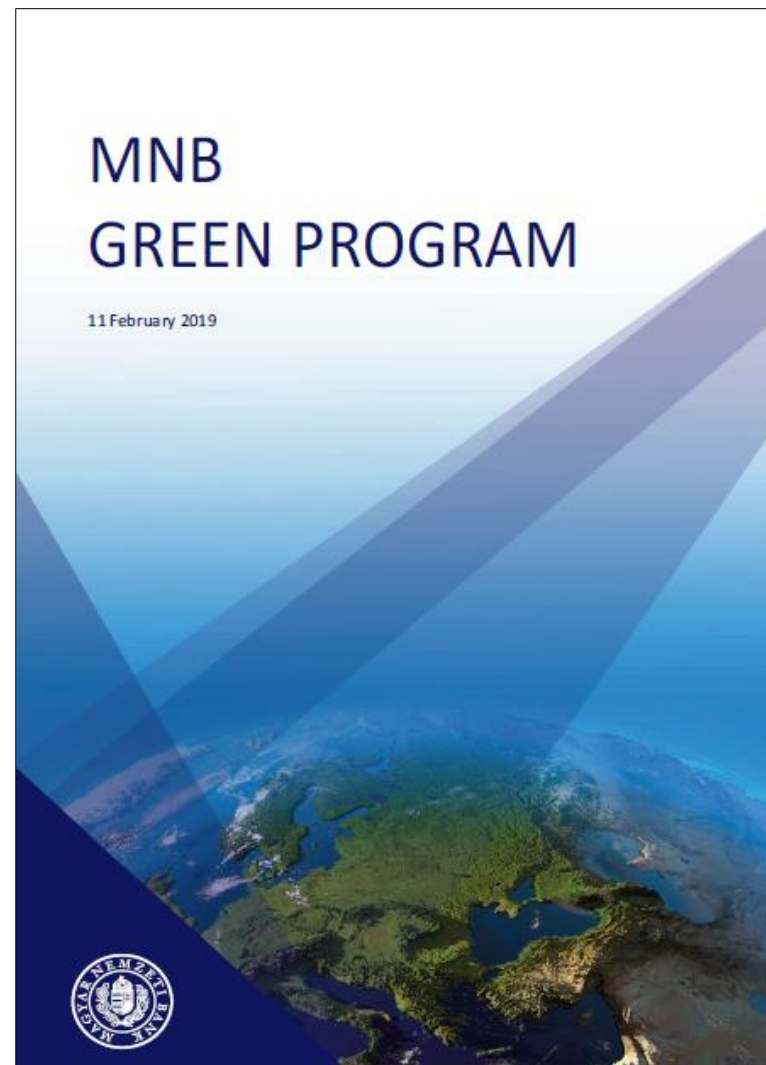
1. address climate &
environmental risks
2. create a supporting
environment for green
finance in Hungary



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I. Initiatives in the financial sector

Analysis of ecological and financial risks

Mobilizing additional funds for green investments

Steps related to green bonds

Incentivizing financial institution's greener operations

II. Social and international relations

1. Enhanced cooperation with domestic partners

Active participation in international work related to climate / green finance

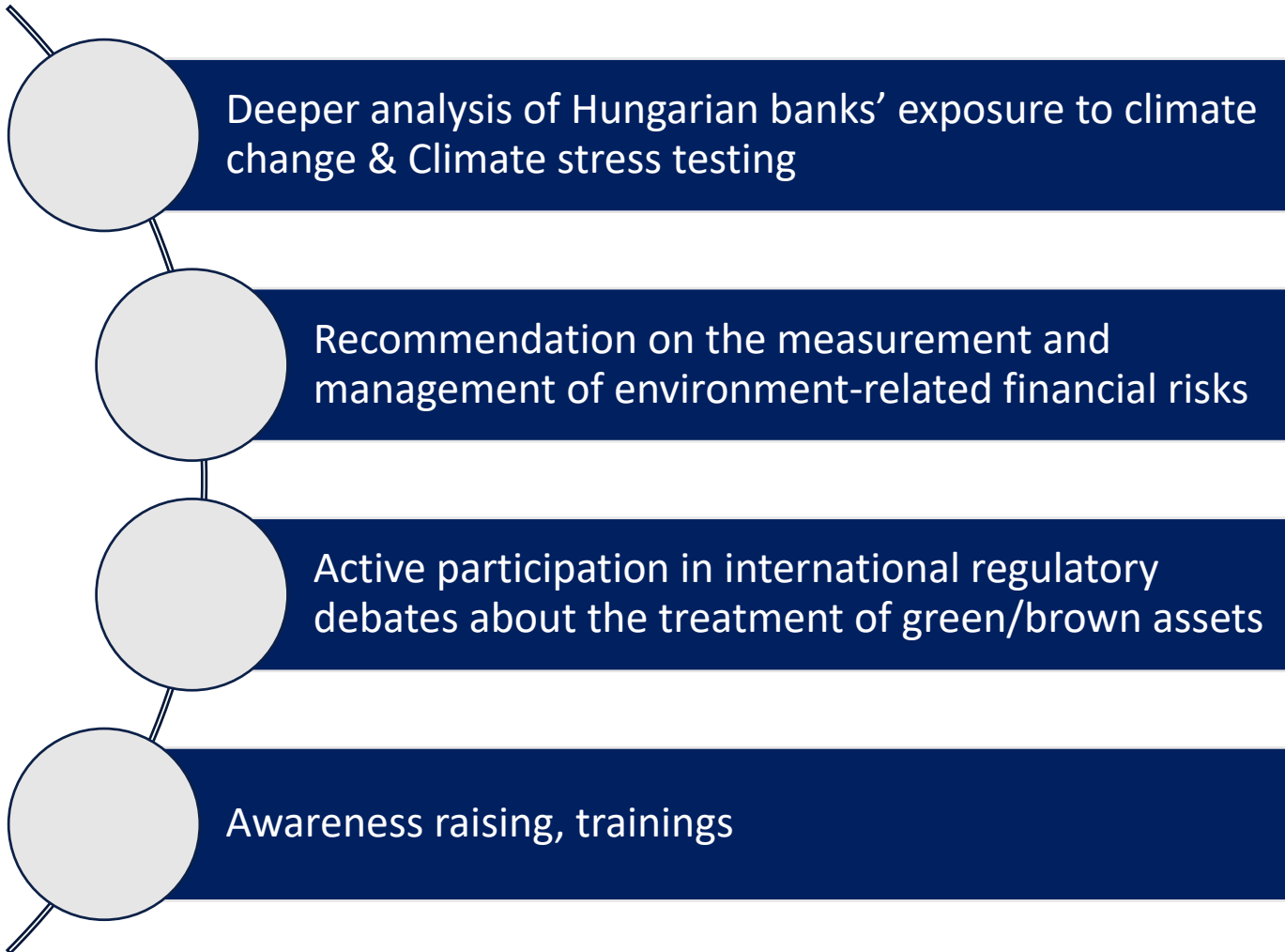
Education and capacity building related to green finance

III. Further greening of MNB's own operations

Further decreasing of MNB's own ecological footprint

Acting as a role model in environmental disclosures

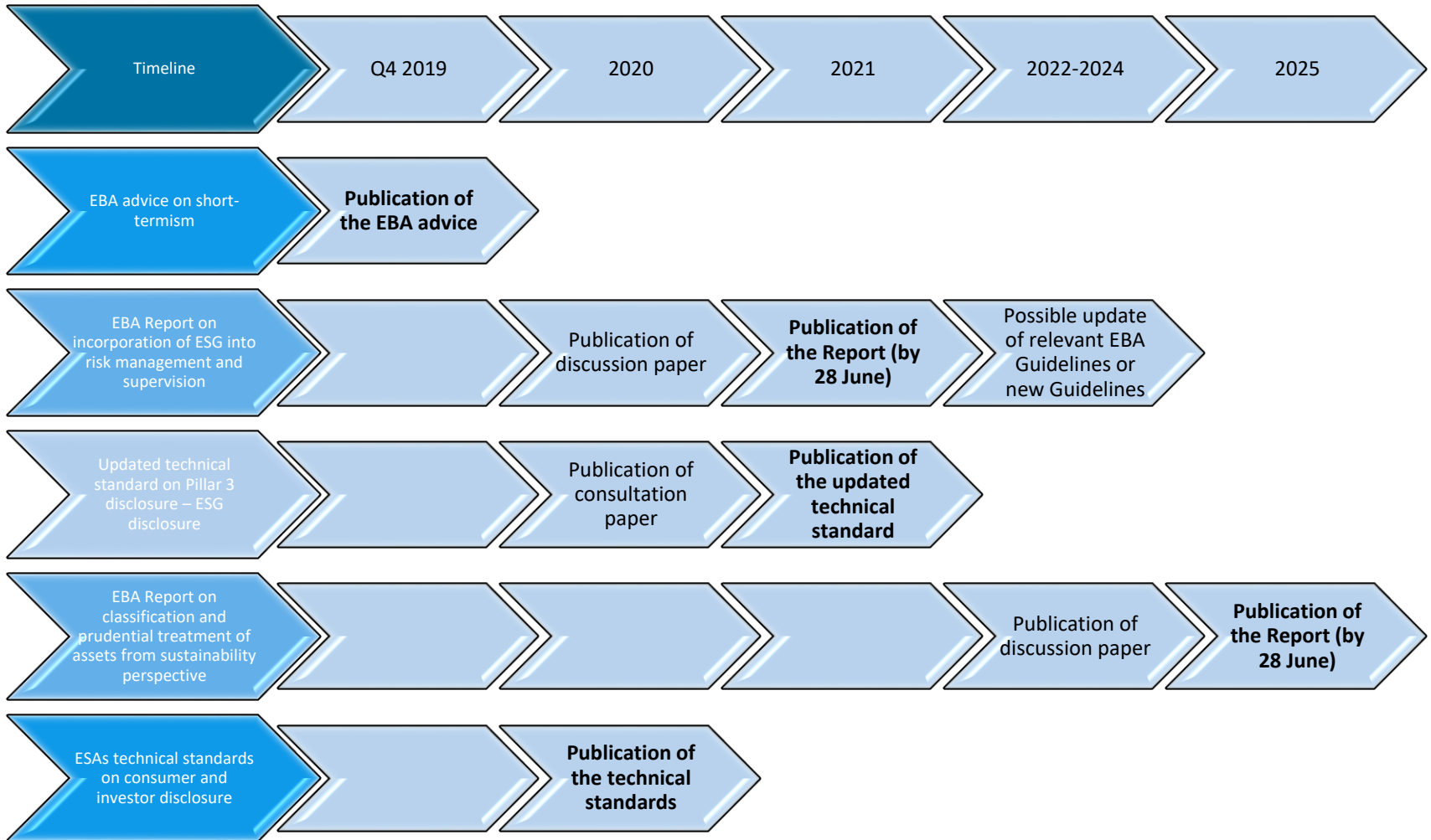
MEASURES TO ADDRESS ENVIRONMENT AND CLIMATE-RELATED RISKS



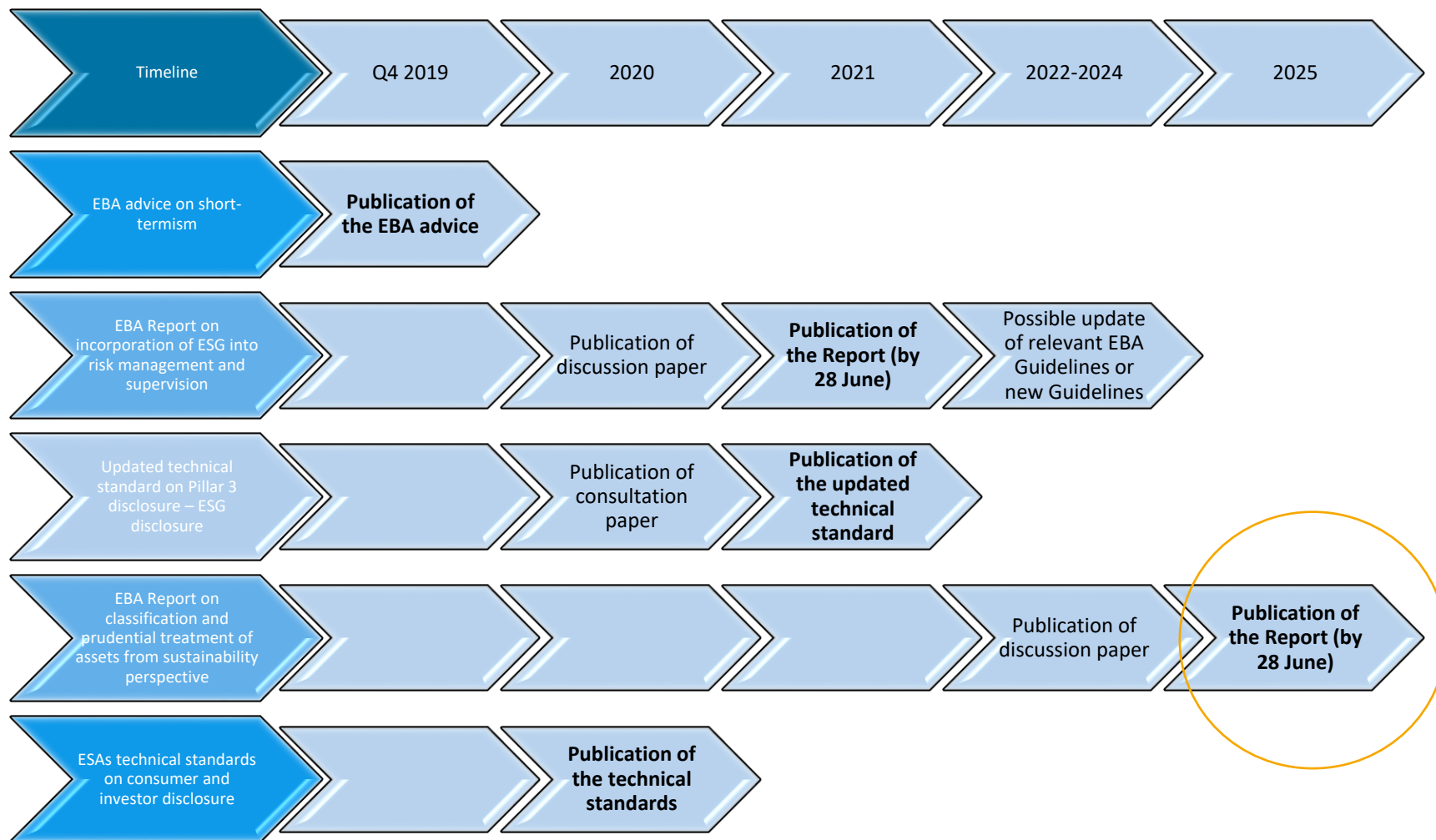


Green support factor

MILESTONES FOR EBA REGULATORY MANDATES ON SUSTAINABLE FINANCE



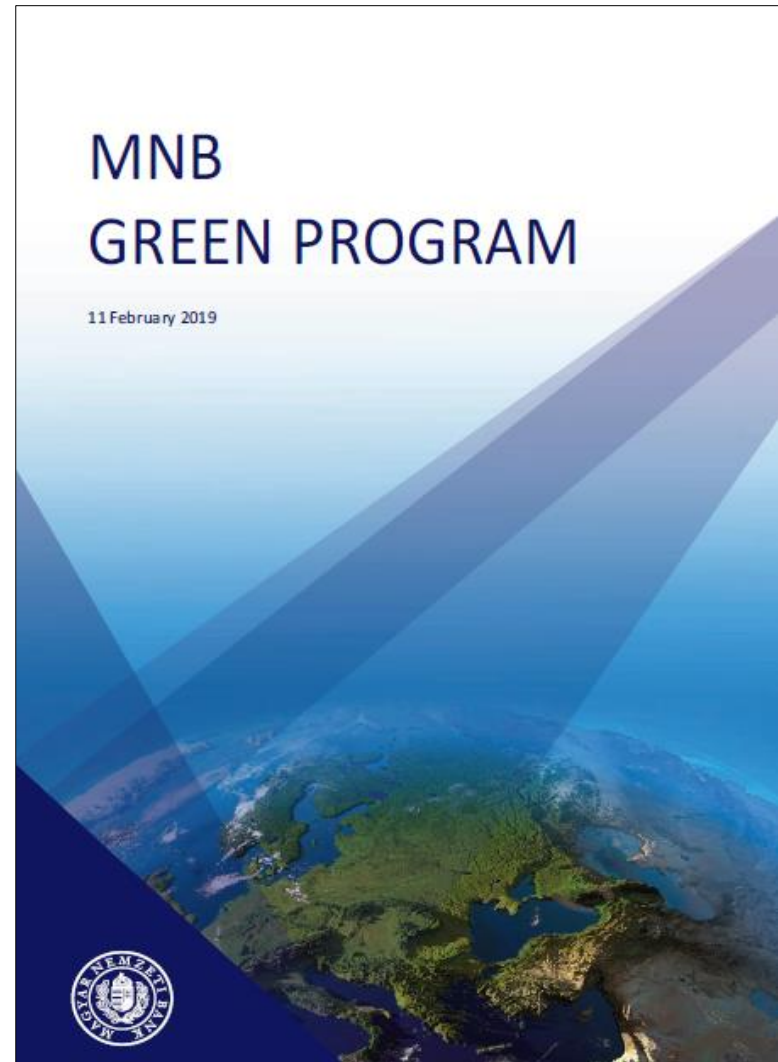
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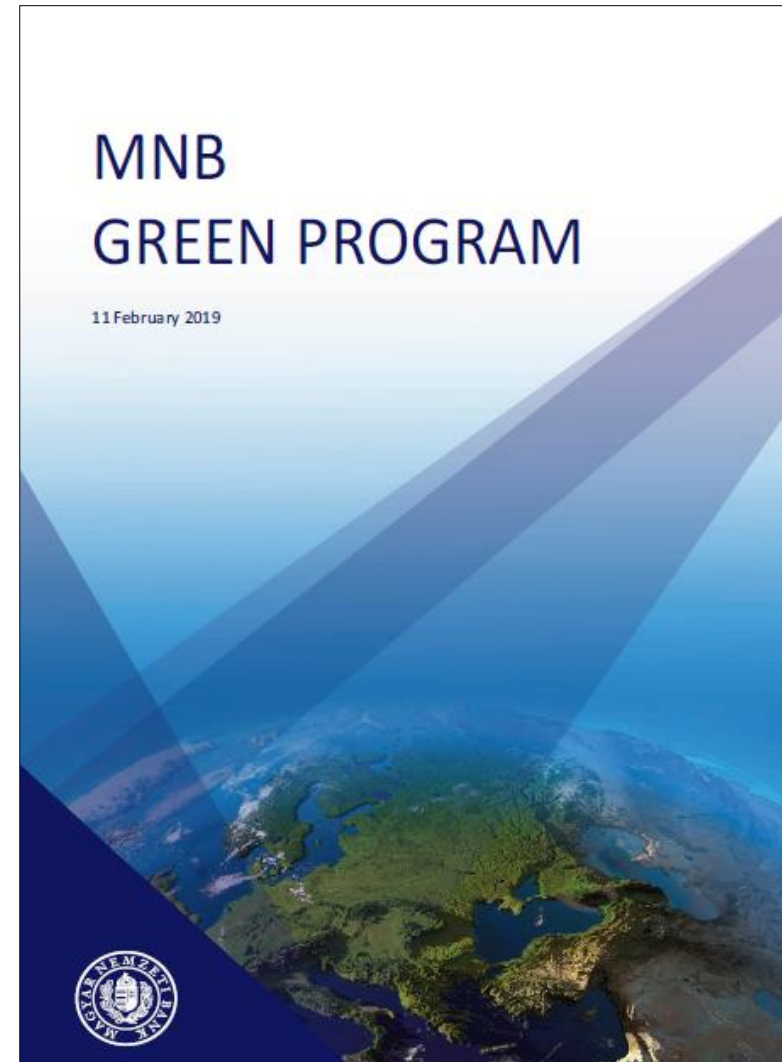
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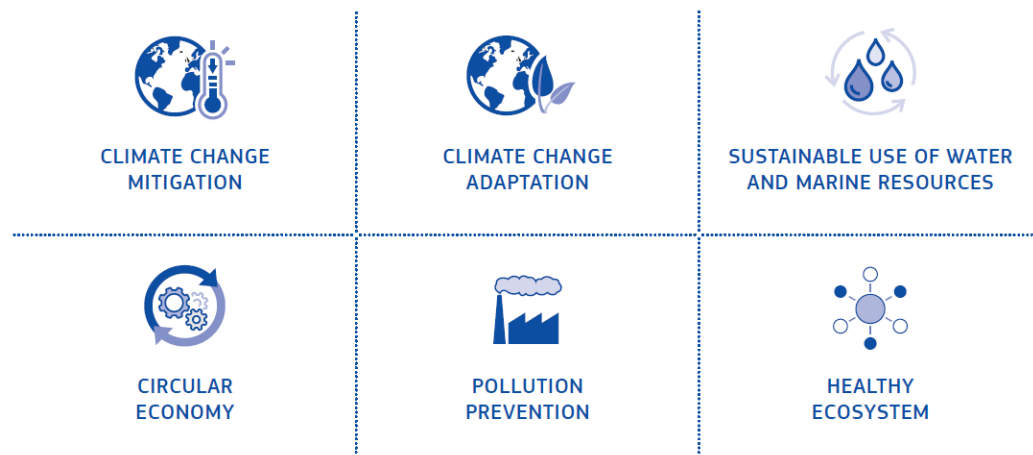
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FINANCING THE DECARBONIZATION OF THE HUNGARIAN ECONOMY

- Preliminary estimates* suggest an annual investment need of HUF 1100-1300 bln (2-3% of GDP) to achieve climate neutrality
- Decarbonization to offer unique business opportunities for market players
- Need for banks and other FIs to strategically enter the sustainable finance segment



Key areas are energy efficiency, renewable energy, clean transport and sustainable land use



*Source: Ministry for Innovation and Technology



Customers

- Low financial literacy
- Weak but increasing care for environmental issues

Green investment products

- Fairly wide supply of self-labelled products
- Modest volumes

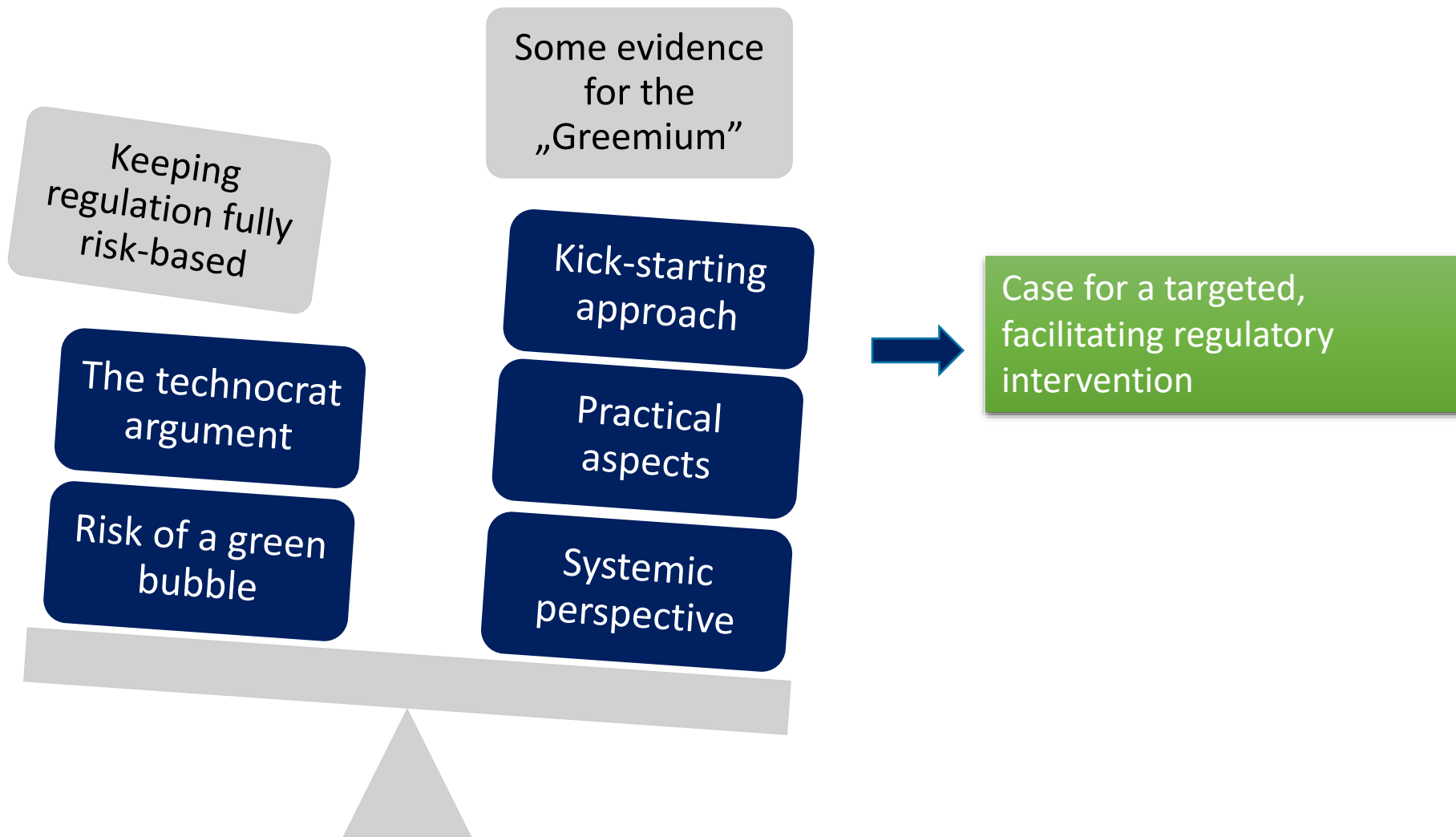
Green banking products

- No externally labelled loan products nor deposits
- Mixed experience with loans related to green buildings
- Possible crowding out from state sponsored products

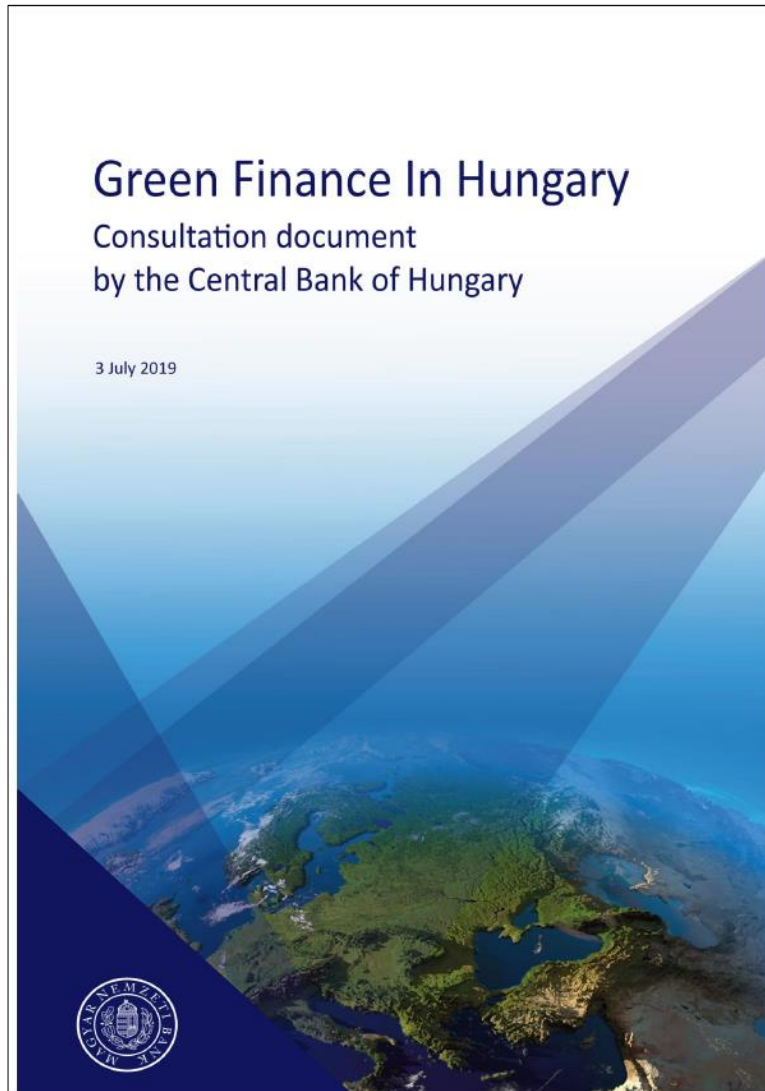
Green bonds

- Little incentive so far for issuers
- Pureplay dilemma

PROS AND CONS OF REGULATORY INTERVENTION



HELPING MARKETS MOVE IN THE RIGHT DIRECTION



- Public consultation about possible measures
- Both structural and prudential measures can play a role
- Need for a coordination with other policies (climate, energy, housing etc.)



Energy Efficient Mortgages Initiative

- Advisory Council membership in the EU Energy Efficient Mortgages Initiative
- Cooperation with domestic university and research partners on the interlinkages of Energy Efficiency and Credit Risk



Energy efficient Mortgages Action Plan



EeDaPP
Energy efficiency Data Protocol and Portal

KEY AREA: ENERGY EFFICIENT LENDING



Higher disposable income for loan service (PD)



Less volatile collateral values (LGD)



Lower credit risk (ceteris paribus)

EXISTING EVIDENCE ABOUT THE EEM HYPOTHESIS



	(2)
EE	0.3547*** [0.1261]
Current LTV	0.5100 [0.5243]
DSCR	30.1220*** [29.9714]
Loan term	1.0113*** [0.0032]
Observations	40,263
Pseudo R-squared	0.405

A sample of 40.000 loans suggests that PD of non-energy efficient mortgages is 2,82 times higher

Significant negative correlation between EE (as dummy variable) and PD

Coefficient of 0,1857 suggests 5,39 times higher PD in case of non EE properties (EPC rating of C or below)

	(1)	(2)	(3)	(4)
EE (A/B rating)	0.4892*** [0.0473]	0.2582* [0.2084]	0.1857* [0.1612]	0.1857** [0.1412]
Current LTV		15.3931*** [6.0488]	21.9993*** [9.9734]	21.9993*** [9.6332]
DSCR		0.9487 [0.0567]	0.9676 [0.0623]	0.9676 [0.0533]
Mortgage term		0.7435 [0.2262]	0.5910 [0.1994]	0.5910* [0.1640]
Borrower controls	No	Yes	Yes	Yes
Dwelling controls	No	Yes	Yes	Yes
Market controls	No	No	Yes	Yes
Mortgage controls	No	Yes	Yes	Yes
Region FE	No	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes
SE	Rob.	Rob.	Rob.	Region Cl.
Observations	126,036	125,560	125,560	125,560
Pseudo R-squared	0.00729	0.271	0.414	0.414

CONSTRUCTION, REAL ESTATE ACTIVITIES – KEY CONSIDERATIONS OF THE EU TAXONOMY REPORT



In the EU, buildings are effectively the largest energy consuming sector, responsible for around 40% of energy consumption and 36% of carbon emissions.

Three-quarters of the European building stock is considered inefficient, but renovation rates remain very low, around 1% per year.

Annual rates of new construction resulting in buildings with higher performance levels (1-2%) clearly inadequate to set the whole sector on a zero-emissions pathway.

While it is necessary to look at both energy demand and GHG emissions as metrics, stakeholders might not be ready to use GHG- metrics.

Transitional approach to use energy metrics, which will be extended to include GHG emissions once sufficient data for the latter is available.

NEW BUILDINGS IN (CURRENT) EU TAXONOMY



Source: TEG Report

26.2 Construction of new buildings

Sector classification and activity	
Macro-Sector	F – Construction
NACE Level	2
Code	F41, F43
Description	Construction of new buildings. This relates primarily to activities under NACE codes 'F41.1 - Development of building projects' and "F41.2 - Construction of residential and non-residential buildings", but includes also activities under NACE code "F43 - Specialised construction activities"
Mitigation criteria	
Principle	<p>Construction of energy and resource efficient and low-GHG emission new buildings can make a substantial contribution to climate change mitigation by reducing GHG emissions from the operational and construction phase of the building lifecycle and this should be measured by appropriate indicators of primary energy and GHG emissions both in the operational phase and along the lifecycle (including embodied emissions).</p> <p>The Taxonomy takes a transitional approach by relying on requirements set in current EU policies but with an intention to develop and start using, as soon as possible, absolute thresholds for energy and carbon performance. These thresholds will be based on ambitious performance benchmarks set by building type. It will be ensured that the criteria are always at least as ambitious, as a minimum, as the level of performance of the top 15% of the local building stock and projected to progressively decline to net zero energy and GHG emissions by 2050.</p>
Metric	<p>There is no single specific metrics defined, as the thresholds rely on requirements set in the national regulation and building codes for NZEB transposing the EPBD in each Member State.</p> <p>The calculation methodology for the measurement of floor area (m²) shall be disclosed with clear definition of what is within boundary.⁴⁰²</p>
Threshold	<p>A new building is eligible when it meets national requirements for NZEB and has a level of energy performance equivalent to the EPC rating of B (or above).⁴⁰³ The appropriateness of such thresholds will be subject to review after publication of a DG ENER study in the autumn of 2019 and further work on the development of absolute thresholds.</p>
	<p>To avoid lock-in and undermining of the climate mitigation objective, the construction of new buildings for the purpose of occupation by fossil fuel extraction, transporting transport of fossil fuels or manufacturing of fossil fuels activities (either for actual extraction, transporting, manufacturing and/or administrative purpose)⁴⁰⁴ are excluded.</p> <p>Eligibility of alternative schemes acting as proxies</p> <p>If an alternative scheme, such as a commercial sustainability certification scheme or a similar national regulation or requirement in countries outside EU proves the respective scheme meets the performance criteria set in the Taxonomy in a defined location, eligibility for the alternative scheme is accepted as a means to prove eligibility for the Taxonomy criteria.</p>

RENOVATION IN (CURRENT) EU TAXONOMY

26.3 Renovation of existing buildings

Sector classification and activity	
Macro-Sector	F – Construction
NACE Level	2
Code	F41, F43
Description	Renovation of existing buildings (residential and non-residential). This relates to activities under NACE codes "F41.1 - Development of building projects, "F41.2 - Construction of residential and non-residential buildings" and "F43 - Specialised construction activities".
Mitigation criteria	
Principle	Renovation of existing buildings makes a substantial contribution to climate change mitigation by reducing energy use and GHG emissions for the remaining operational phase of the buildings as well as by avoiding emissions that would occur through the construction of new buildings.
Metric	The thresholds rely on either the respective metrics set in the applicable building regulation and building codes for major renovations transposing the EPBD, or, in the case of relative improvements, on energy savings calculated in terms of net primary energy demand during the operational phase of the building life-cycle, i.e. "Phase B6" according to CEN T350, expressed as kWh/m ² per year. The calculation methodology for the measurement of floor area (m ²) shall be disclosed with clear definition of what is within boundary. ⁴¹⁰
Threshold	A renovation is eligible when it meets either of the following criteria: <ul style="list-style-type: none"> a) The renovation is compliant with energy performance standards set in the applicable building regulations for major renovations transposing the Energy Performance of Buildings Directive (EPBD); or, b) The renovation achieves energy savings⁴¹¹ of at least 30% in comparison to the baseline performance of the building before the renovation. The baseline performance and predicted improvement shall be based on a specialised building survey and be validated by an accredited energy auditor. <p>To avoid lock-in and undermining of the climate mitigation objective, the renovation of buildings for the purpose of occupation by fossil fuel extraction, transporting transport of fossil fuels or manufacturing of fossil fuels activities (either for actual extraction, transporting, manufacturing and/or administrative purpose)⁴¹² are excluded.</p>
	Eligibility of alternative schemes acting as proxies If an alternative scheme, such as a commercial sustainability certification scheme or a similar national regulation or requirement in countries outside EU proves the respective scheme meets the performance criteria set in the Taxonomy in a defined location, eligible for the alternative scheme is accepted as a means to prove eligibility with the criteria.



INDIVIDUAL RENOVATION MEASURES AND OTHER ACTIVITIES

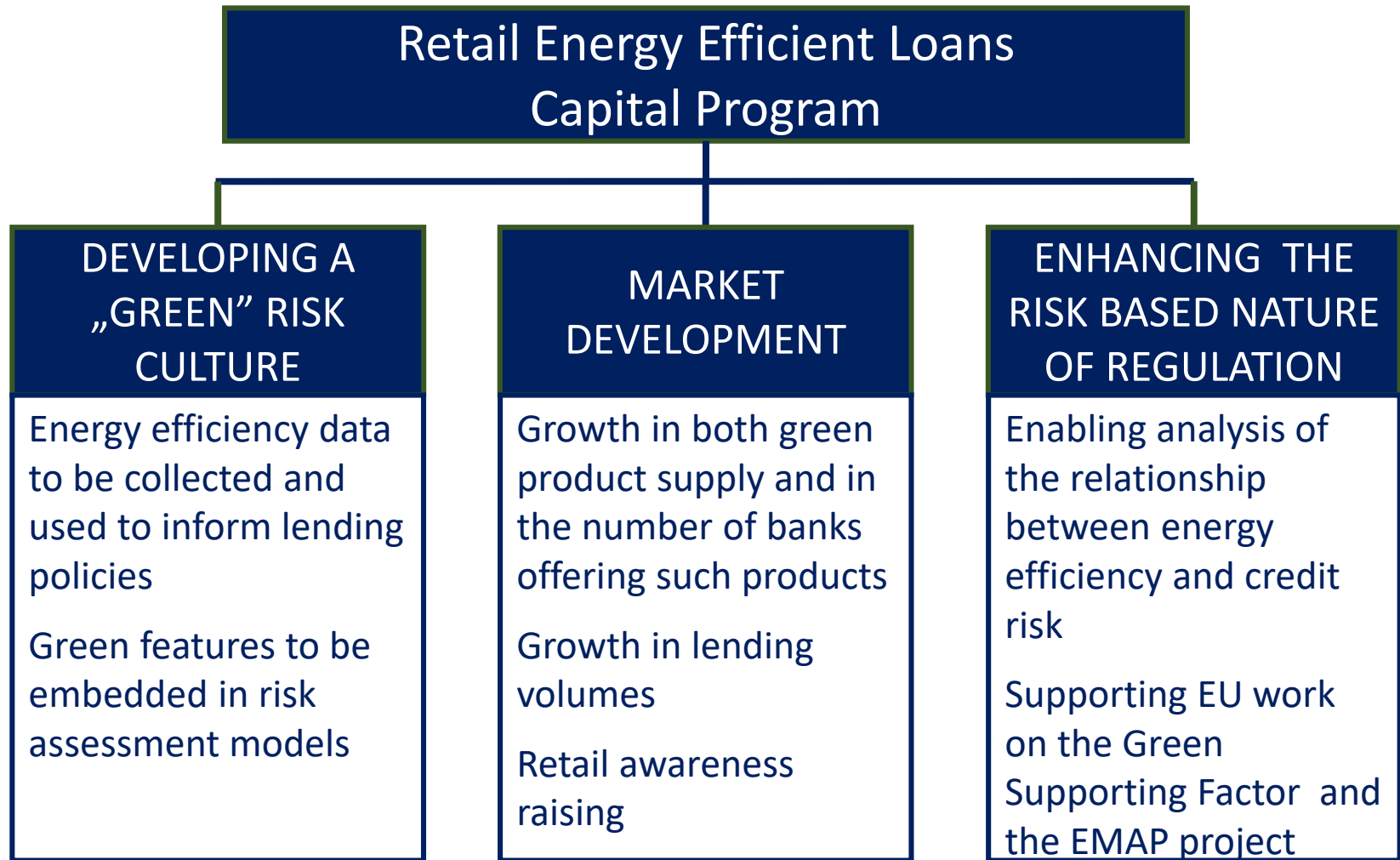


26.4 Individual renovation measures, installation of renewables on-site and professional, scientific and technical activities

Sector classification and activity	
Macro-Sector	F – Construction
NACE Level	2
Code	F41, F43
Description	Individual renovation measures, installation of renewables on-site and professional, scientific and technical activities. This relates to activities under NACE codes "F41.2 - Construction of residential and non-residential buildings", "F43 - Specialised construction activities", "M – Professional, scientific and technical activities".
Mitigation criteria	
Principle	Individual renovation measures and the installation of renewables on-site make a contribution to climate change mitigation by reducing GHG emissions for the remaining operational phase of the buildings. Professional, scientific and technical activities are a necessary support and validation mechanism for building renovation.
Metric	There are no defined metrics. In the case of individual building renovation measures, the thresholds rely on requirements set in the national regulation and building codes transposing the EPBD by each Member State.
Threshold	<p>The following on-site renewable energy installations are eligible:</p> <ul style="list-style-type: none"> • Installation of solar photovoltaic modules (and the ancillary technical equipment) • Installation of solar hot water panels (and the ancillary technical equipment) • Installation of ground-source heat pumps using a refrigerant with GWP<10, calculated following Annex IV of Regulation (EU) No 517/2014 (F-gas Regulation), (and the ancillary technical equipment) • Installation of wind turbines (and the ancillary technical equipment) • Installation of solar transpired collectors (and the ancillary technical equipment) • Installation of thermal or electric energy storage units (and the ancillary technical equipment) <p>The following individual building renovation measures are eligible if compliant with the energy performance standards set for individual components and systems in the applicable building regulations transposing the Energy Performance Building Directive (EPBD):</p> <ul style="list-style-type: none"> • Addition of insulation to the existing envelope components, such as external walls, roofs (including green roofs), lofts, basements and ground floors (including measures to ensure air-tightness, measures to reduce

(continued)





PREFERENTIAL PILLAR 2 TREATMENT A CONDITION OF DATA COLLECTION & REPORTING

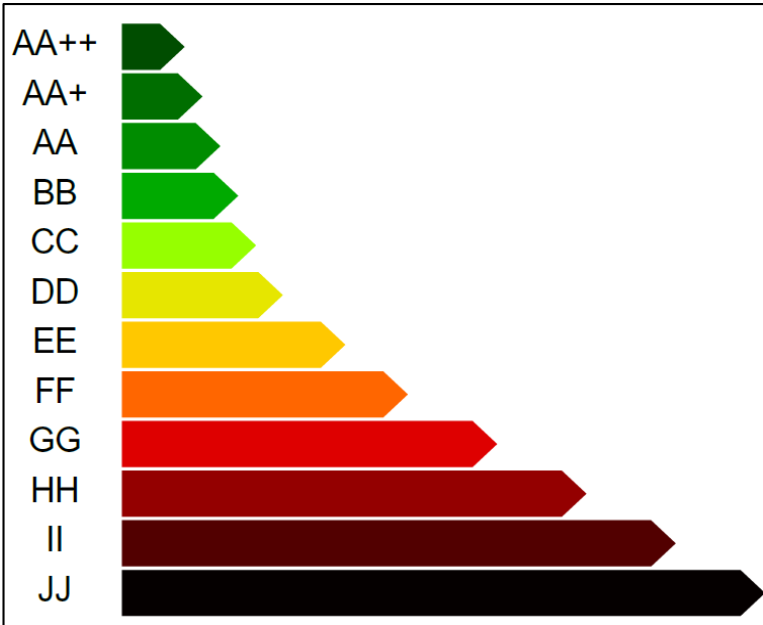


Data collection's goals

Underpin research on green vs. brown assets

Calculation of capital relief

Allowing ex-post inspections



EPC CERTIFICATE AS THE BASIS OF DATA COLLECTION

- Contains all necessary information
- Compulsory for new buildings and for sales transactions
- Publicly available on a dedicated website...
- ...but GDPR as legal barrier to directly link EPC certificates with AnaCredit-like loan databases
- Need for data collection also in case of non-green mortgages to allow green vs. brown analysis

OTHER DATA TO BE REPORTED

- Interest rate discount applied
- Categorization of individual renovation measures

Expansion opportunities

- to non-residential properties – stronger business case + benefits of LEED/BREEAM vs. higher heterogeneity;
- brown penalizing factor?

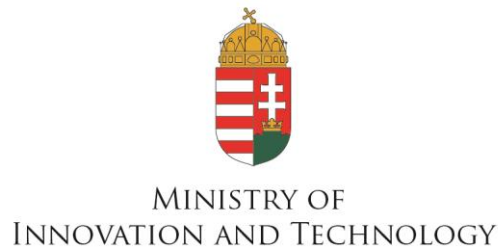
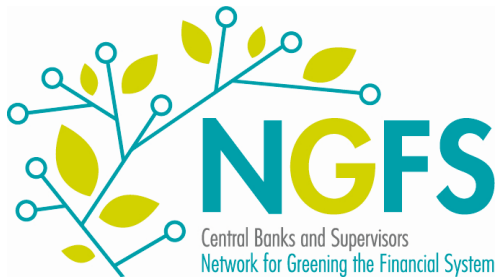
PLANNED MEASURES TO CREATE A SUPPORTING ENVIRONMENT FOR GREEN FINANCE IN HUNGARY





Coordination with other regulatory tools and frameworks

COORDINATION WITH OTHER REGULATORY TOOLS AND FRAMEWORKS





THANK YOU FOR YOUR
ATTENTION!

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