

in Romania 2022

Climate risk dashboard for the banking sector in Romania 2022

NOTES

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Overview

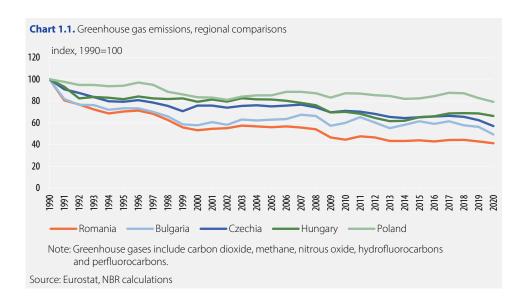
The key topics highlighted by this analysis¹ cover the following:

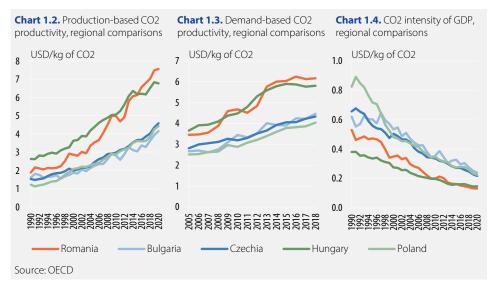
- Greenhouse gas emissions in Romania continued to follow a downward path in 2020 as well, accounting for 41.2 percent of the 1990 level and standing 1.6 percentage points lower than in 2019. Romania further ranks first among its regional peers with respect to the decarbonisation of the economy. The consumption of energy from renewable sources in Romania is above the European and regional average.
- The main physical risks assessed in the analysis refer to floods, drought and extreme heat. Companies in Romania operating in sectors that might be affected by these (medium and high) risks are relevant for the economy. They generated 25 percent of total gross value added in 2021. The related bank exposure accounted for 30 percent of lending to non-financial corporations in 2021.
- The economic relevance of non-financial corporations exposed to transition risk (brown companies) remained unchanged during 2021 versus the previous year. Their profitability improved in 2021, similarly to developments at aggregate level, but stays below the average for non-financial corporations. In terms of absolute value, bank exposure to brown companies rose markedly compared to the data published in the previous *Dashboard* (up 30 percent), in line with trends at aggregate level. The share of loans to these companies in total bank exposures to non-financial corporations went up moderately, i.e. 2.5 percentage points, during the same period. Conversely, the carbon intensity of loans to brown sectors remained on a downward trend in 2021 as well.
- Global green bond issuance surged 210 percent in 2021 versus the previous year. EU Member States further held the largest share of total green bonds issued worldwide. Moreover, progress was made domestically as well. Specifically, Romania saw the issuance of green and sustainability bonds worth lei 2.3 billion in 2021 and lei 1.7 billion in 2022 (until October). At the same time, green bank loans (reported since May 2022) reached lei 976 million in September 2022.
- Romania supports the EU environmental objectives as regards the accomplishment of climate transition via significantly cutting greenhouse gas emissions by 2030 (by at least 55 percent compared to the 1990 level) and the achievement of climate neutrality by 2050. The most recent data on climate scenarios released by the Network for Greening the Financial System show that, in the case of Romania, for the 2022-2050 period, the transition measures implemented in an orderly manner are likely to contribute more effectively to sustainable economic growth over the medium and long term.

This report is drafted in accordance with measure 12 in NCMO Recommendation No. R/6/2021 on supporting green finance addressed to the National Bank of Romania.

1. Real economy

Greenhouse gas emissions in Romania continued to follow a downward path in 2020 as well, accounting for 41.2 percent of the 1990 level and standing 1.6 percentage points lower than in 2019. This is the strongest reduction among the countries in the region. The largest drop in greenhouse gas emissions (by approximately 30 percent) occurred after the fall of the communist regime, between 1991 and 1994, amid the full or partial shutdown of some industrial conglomerates with high carbon emissions and the slowdown in industrial activity in general (Chart 1.1).

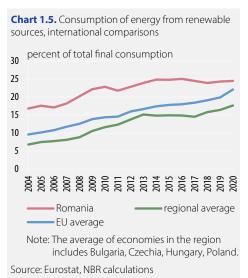


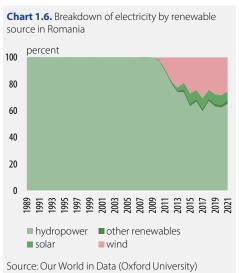


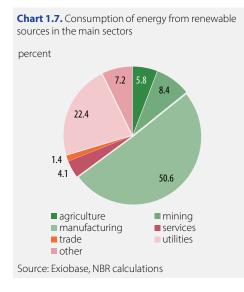
Romania further ranks first among its regional peers with respect to the decarbonisation of the economy, achieving the best performance in terms

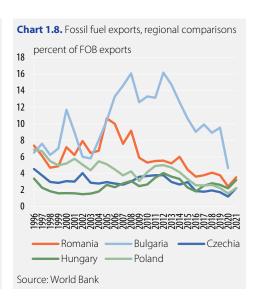
of CO2 intensity of GDP and both production-based and demand-based CO2 productivity (Charts 1.2², 1.3² and 1.4²).

Since 1990, significant efforts have been made to increase renewable sources in Romania. For almost two decades, the consumption of energy from renewable sources in Romania has exceeded the average of the countries in the region and the EU average (24.3 percent versus 17.6 percent and 22.1 percent respectively, according to 2020 data; Chart 1.5). Nonetheless, it is worth noting that this rise has levelled off in Romania over the past years, hovering around 25 percent from 2013 to 2020 (Chart 1.5).









The indicators presented are included among the green growth indicators calculated by the OECD (https://www.oecd.org/greengrowth/green-growth-indicators/). Production-based CO2 productivity reflects the real GDP generated per unit of CO2 emitted. Emissions from the combustion of coal, oil, natural gas and other fuels are included. Demand-based CO2 productivity reflects the real GDP generated per unit of CO2 emitted to satisfy domestic final demand. Demand-based CO2 emissions include the CO2 from energy use emitted during the various stages of production (in the country or abroad) of goods and services consumed in domestic final demand. Carbon intensity of GDP is GDP generated per emissions from production, similarly to those used to calculate CO2 productivity.

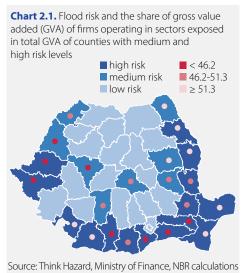
Romania met the target set under the National Renewable Energy Action Plan as early as 2019. This favourable development occurred amid the diversification of renewable energy sources (hydropower, solar, wind and other renewables, Chart 1.6).

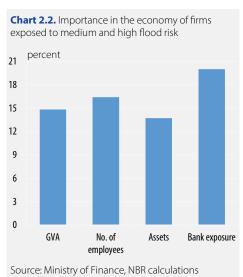
In Romania, the main sectors that consume energy from renewable sources are manufacturing (51 percent) and utilities (22.4 percent, Chart 1.7).

2. Physical risk

The main physical risks assessed herein refer to floods, drought and extreme heat. Thus, the analysis identified 23, 31 and 30 counties with medium and high risks of floods, drought and extreme heat.

The bank exposure to local companies operating in sectors that might be affected by (medium and high) physical risks is relatively moderate (7 percent for drought risk, 8.6 percent for extreme heat risk and 20 percent for flood risk), as shown in Charts 2.2, 2.4 and 2.6.

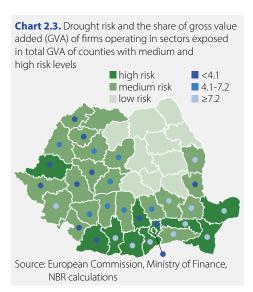


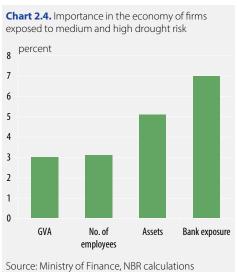


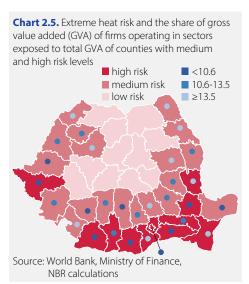
Companies in Romania operating in sectors that might be affected by (medium and high) physical risks are relevant for the economy. As for the flood risk, non-financial corporations in the sectors vulnerable to this risk generated 15 percent of the gross value added (GVA) at aggregate level in 2021 and held 13.7 percent of total assets (Charts 2.1³ and 2.2³). It is worth mentioning that the firms producing the largest

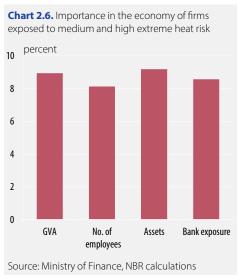
A number of 23 counties were assessed as being exposed to medium and high flood risk. The analysis took into account the non-financial corporations operating in the following business sectors, considering that they may be affected by the flood risk: agriculture, manufacturing and services (for further information, see Annex 2). The ranges for the share of gross value added (GVA) of firms in the sectors exposed to total GVA of counties with medium and high risk levels were determined based on the calculation of the 33rd and 66th percentiles.

part of GVA in 2021 (71 percent) are located in counties with low flood risk. In what concerns the drought risk, the firms in the sectors exposed to this risk generated only 3 percent of total GVA in 2021, while holding 5.1 percent of total assets (Charts 2.3⁴ and 2.4⁴). Non-financial corporations affected by the extreme heat risk generated 9 percent of total GVA in 2021 and held 9.2 percent of total assets (Charts 2.5⁵ and 2.6⁵).





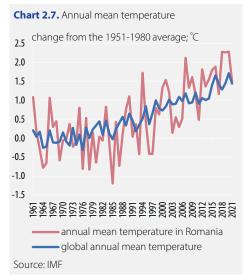


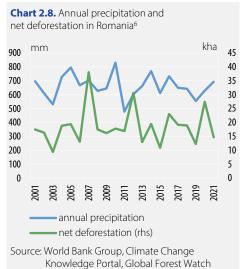


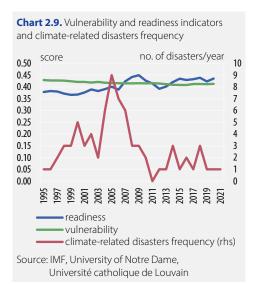
The drought risk categories were differentiated by calculating the quartiles of SPEI – Standard Precipitation–Evapotranspiration Index (World Bank, Climate Change Knowledge Portal). A number of 31 counties were assessed as being exposed to medium and high drought risk. The analysis took into account the non-financial corporations operating in the following business sectors, considering that they may be affected by the drought risk: agriculture and utilities (for further information, see Annex 2). The ranges for the share of gross value added (GVA) of firms in the sectors exposed to total GVA of counties with medium and high risk levels were determined based on the calculation of the 33rd and 66th percentiles.

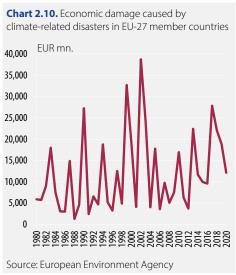
The categories of extreme heat risk were designated by calculating the quartiles of the annual averages of the maximum monthly temperatures. A number of 30 counties were assessed as being exposed to medium and high risk of high temperatures. The analysis took into account the non-financial corporations operating in the following business sectors, considering that they may be affected by the extreme heat risk: construction (for further information, see Annex 2). The ranges for the share of gross value added (GVA) of firms in the sectors exposed to total GVA of counties with medium and high risk levels were determined based on the calculation of the 33rd and 66th percentiles.

Global warming has led to a rise in the annual mean temperature over the past 30 years, which gradually grew above the average for the 1951-1980 period. This hit an all-time high successively in 2018, 2019 and 2020, exceeding by 2.3°C the average of the reference period. In 2021, the mean temperature in Romania dropped moderately and was in line with the global mean temperature, i.e. 1.5°C higher than the average for the 1951-1980 period (Chart 2.7).







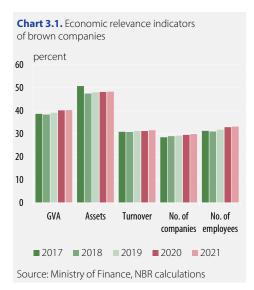


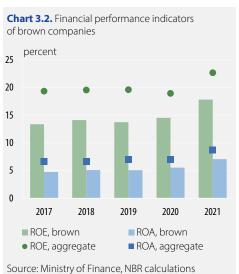
Net deforestation shows the area of forests lost on an annual basis, expressed in kilohectares. Data come from a collaboration between the University of Maryland, Google, *United States Geological Survey* and NASA, based on satellite images.

In 1980-2021, 39 natural disasters occurred in Romania (Chart 2.9⁷), causing economic losses⁸ in amount of approximately EUR 14 billion. Climate-related disasters produced economic damage of EUR 487 billion among EU Member States in the period from 1980 to 2020 (Chart 2.10).

In 2021, one natural disaster in the "flood" category took place in Romania. Annual precipitation recorded an average growth of 65 mm in 2021 as compared with 2020 (Chart 2.8).

3. Transition risk





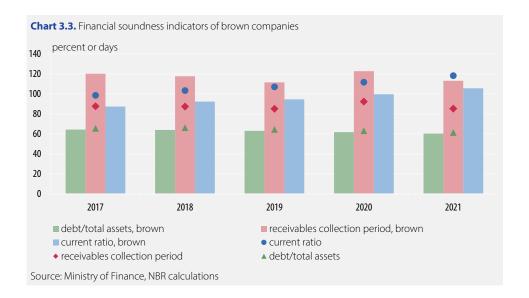
The economic relevance of non-financial corporations exposed to transition risk (brown companies) remained unchanged in 2021 compared to the previous year (Chart 3.1°). Specifically, during the year under review, they generated 40 percent of gross value added at aggregate level, held 48 percent of total assets of non-financial

Readiness is one of the two components of the ND-GAIN index devised by the University of Notre Dame (https://gain.nd.edu/our-work/country-index/methodology/). It illustrates the availability and ease with which a country can make investments to adapt to the new conditions, due to a safe and efficient business environment. It comprises three essential components, i.e. economic readiness, social readiness and governance readiness. A higher value shows a better situation. Vulnerability is the other dimension of adaptation included in the ND-GAIN index and focuses on the society's propensity to be adversely affected by climate hazards. This aims to gauge a country's exposure, sensitivity and adaptive capacity to climate change. It measures the country's vulnerability in terms of six life-supporting sectors: food, water, health, ecosystem service, human habitat and infrastructure. A higher value shows a weaker situation. The climate-related disasters frequency shows the number of climate disasters (drought, extreme temperatures, floods, landslides, storms and wildfires) on an annual basis

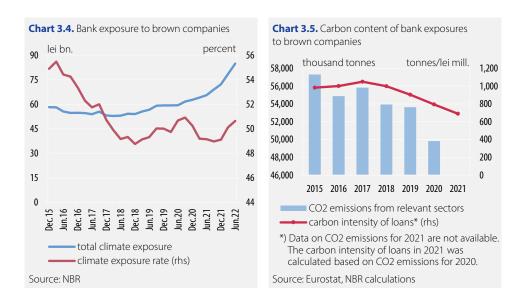
The economic damage is the quantification of the damage caused by hydrological, climatological and meteorological extreme events.

Brown companies were identified based on the Methodology for identifying climate-relevant sectors presented in the Report by the NCMO Working Group on supporting green finance (http://www.cnsmro.ro/res/ups/Summary-Report-NCMO-green-finance.pdf). Thus, the analysis takes into account all the companies whose main activity is classified under the NACE codes in the NACE divisions shown in Annex 1.

corporations and had 33 percent of total employees in non-financial corporations. Their profitability improved in 2021, similarly to developments at aggregate level, but stays below the average for non-financial corporations (Chart 3.29).

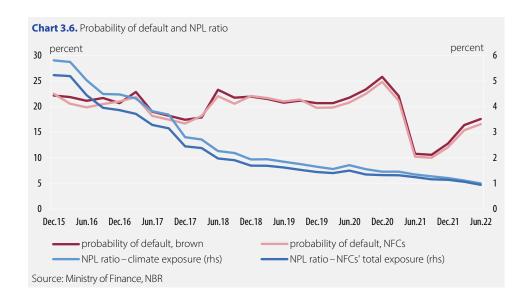


The banking sector's exposure to brown companies recorded a marked increase since the release of the previous *Dashboard*, in line with trends at aggregate level (Chart 3.4). The stock of loans to these companies amounted to lei 84 billion in June 2022 (up 30 percent from June 2021) and accounted for 50.6 percent (up 2.5 percentage points against June 2021) of total bank exposures to non-financial corporations. The carbon intensity of loans to climate-relevant sectors fell by 14 percent in 2021 versus the previous year¹⁰, so that at year-end it stood at 690.2 tonnes/lei million (Chart 3.5).



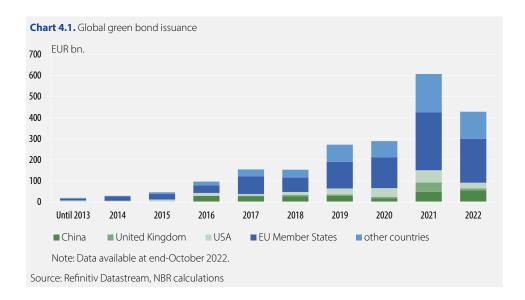
¹⁰ Data on CO2 emissions for 2021 are not available. The carbon intensity of loans in 2021 was calculated based on CO2 emissions for 2020.

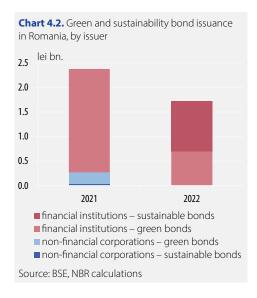
The NPL ratio for loans to brown companies reached 5 percent in June 2022, down 1.7 percentage points from the same year-earlier period. However, it is still above the NPL ratio at aggregate level, which came in at 4.7 percent in June 2022. Moreover, the average probability of default of brown companies remains higher than that economy-wide (Chart 3.6).



4. Green finance

In 2021, global green bond issuance amounted to EUR 607 billion, up sharply from 2020 (210 percent), pinpointing investors' strong and growing interest in such instruments (Chart 4.1).

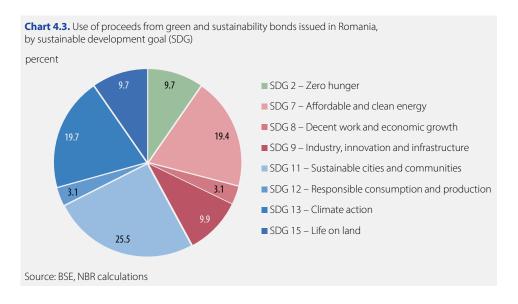




EU Member States further held the largest share of total green bonds issued (45 percent, or EUR 273 billion), ahead of the United States (9.6 percent, EUR 58 billion) and China (8 percent, EUR 48 billion). Issuance of green bonds continued at a fast pace in 2022 as well, with the value of bonds issued until end-October standing at around EUR 430 billion.

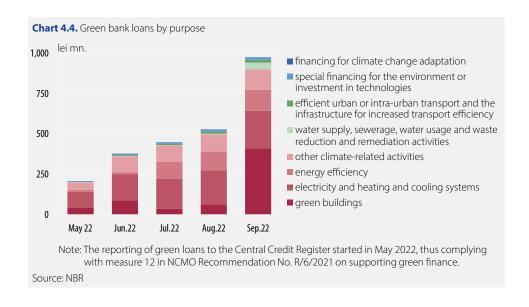
Romania saw the issuance of green and sustainability bonds worth lei 2.3 billion in 2021, in a total of five issues. Also in 2022 (until October), in three issues, green and sustainability bonds reached

lei 1.7 billion (Chart 4.2¹¹). Most of the proceeds raised via these instruments will help achieve the Sustainable Development Goal (SDG) 11 – Sustainable cities and communities (25.5 percent of total) and SDG 13 – Climate action (19.7 percent of total) (Chart 4.3¹¹).



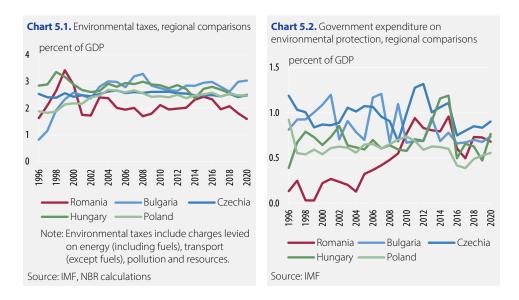
At the same time, green bank loans (reported since May 2022) granted to non-financial corporations reached lei 976 million in September 2022 (Chart 4.4). Their main purposes are green buildings (42 percent of total green loans), electricity and heating and cooling systems (24 percent) and energy efficiency investment (13 percent).

¹¹ Data are available at end-October 2022. Sustainability bonds are bond instruments where the proceeds will be solely applied to finance or refinance a combination of both green and social projects.



5. Government policies

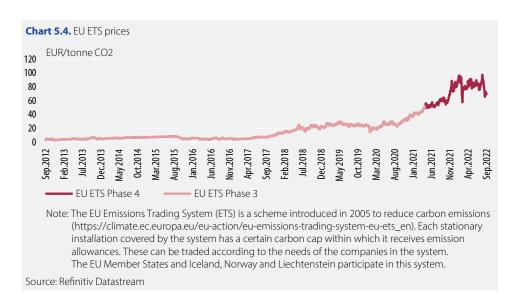
In 2020, environmental taxes in Romania amounted to 1.6 percent of GDP, which is below the regional average (2.6 percent, Chart 5.1). Government spending on environmental protection accounted for 0.7 percent of GDP in 2020, which is relatively close to the average of the countries in the region (Chart 5.2).



Globally, there are 68 initiatives currently implemented regarding carbon pricing. These policies cover 11.8 GtCO2e, representing 23.1 percent of total GHG emissions worldwide¹² (Chart 5.3).



The carbon price in the EU emissions trading system (EU ETS) continued to rise substantially in 2022. The indicator's historical high was reached in August 2022 (EUR 97.6 per tonne of CO2), and at the moment (October 2022) the EU ETS carbon price is EUR 70 per tonne of CO2 (Chart 5.4).

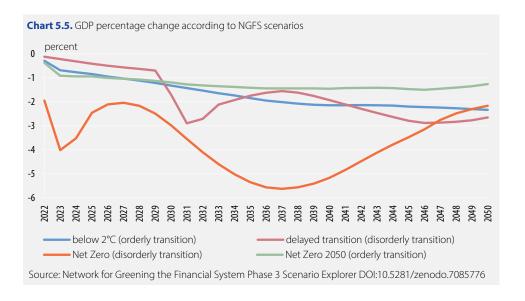


Romania supports the EU environmental objectives as regards the accomplishment of climate transition by significantly cutting greenhouse gas emissions by 2030 (by at least 55 percent compared to the 1990 level) and the achievement of climate neutrality by 2050. To this end, our country can access funds via the Environmental Fund Administration and can also absorb European funds, *inter alia* via NRRP and

 $^{^{12}\} According to the most recent World Bank data (https://carbonpricingdashboard.worldbank.org/).$

the Multiannual Financial Framework 2021-2027. Furthermore, it can raise green grants (and loans) via the Next Generation EU (NGEU) programme. In this respect, 30 percent of the programmes under the Multiannual Financial Framework 2021-2027 and NGEU, as well as 37 percent of the programmes under the Recovery and Resilience Facility, are targeting climate action¹³. Moreover, 41 percent of the funds totalling EUR 29.18 billion under the NRRP¹⁴ are allocated for reforms and investments conducive to achieving climate objectives.

The most recent data on climate scenarios released by the Network for Greening the Financial System¹⁵ show that in the case of Romania, for the 2022-2050 period, the transition measures implemented in an orderly manner are likely to contribute more effectively to a sustainable economic growth over the medium and long term (Chart 5.5¹⁶).



¹³ According to the report of the working group with the Presidential Administration: Limiting climate change and its impact: an integrated approach for Romania.

¹⁴ EUR 14.24 billion in grants and EUR 14.94 billion in loans.

¹⁵ Network for Greening the Financial System, the macroeconomic model NiGEM 2022.

According to the NiGEM GCAM v1.22 model developed by the NGFS. The model combining the transition risk with the chronic physical risk was used. The orderly "Below 2°C" scenario gives a 67 percent chance of limiting global warming to below 2°C by 2100. The orderly "Net Zero 2050" scenario foresees global CO2 emissions to be at net-zero in 2050. The disorderly "Delayed Transition" scenario assumes a "fossil recovery" over the next 10 years, with no new climate policies being introduced until 2030. Subsequently, it is assumed that countries with a their clear commitment to a specific climate-neutral target will meet their objective on regional fragmentation – regionally differentiated CO2 allowance prices will align with the global price around 2070, in order to keep the 67 percent chance of limiting global warming to below 2°C by 2100. The disorderly "Divergent Net Zero" scenario assumes that the median temperature will be brought below 1.5°C in 2100 after a limited temporary overshoot. Furthermore, policy pressure and mitigation efforts are unevenly distributed across sectors, with stronger mitigation actions taking place in the transport and building sectors to reflect more consumer-oriented measures.

Annexes

1. Climate-relevant sectors

NACE division	Name
01	Crop and animal production, hunting and related service activities
05-09	Mining and quarrying
10-12	Manufacture of food products; manufacture of beverages; manufacture of tobacco products
17	Manufacture of paper and paper products
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
23	Manufacture of other non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
35	Electricity, gas, steam and air conditioning supply
37-39	Sewerage, waste management and remediation activities
49	Land transport and transport via pipelines
41-43	Construction
51	Air transport
68	Real estate activities

2. Sectoral breakdown by NACE division depending on physical risk categories

	Flood risk
01	Crop and animal production, hunting and related service activities
02	Forestry and logging
03	Fishing and aquaculture
10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
22	Manufacture of rubber and plastic products
23	Manufacture of other non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment
31	Manufacture of furniture
32	Other manufacturing n.e.c.
33	Repair and installation of machinery and equipment
49	Land transport and transport via pipelines
52	Warehousing and support activities for transportation
53	Postal and courier activities
	Drought risk
01	Crop and animal production, hunting and related service activities
02	Forestry and logging
03	Fishing and aquaculture
36	Water collection, treatment and supply
	Extreme heat risk
41	Construction of buildings
42	Civil engineering
43	Specialised construction activities

3. Climate finance activities

Renewable energy:

- Production of energy from clean sources (solar, wind, geothermal energy, biomass, etc.)
- Improvement of transport and distribution mechanisms
- Investment in the development of storage systems

Energy efficiency:

- Improvement of industrial facilities or their replacement with new ones
- Investment in residential/commercial/public property, vehicles (car fleet improvement or renewal)
- Lighting, heating systems, insulation (included in the energy efficiency)

Waste and wastewater reduction

Transport:

- Change in urban transport mode (also via measures to support the non-motorised transport)
- Management measures to reduce the greenhouse gas emissions (parking lots, carless areas, etc.)
- Interurban railway transport as an alternative to road/air transport
- Infrastructure for low-carbon, efficient transport

Climate change mitigation activities

Green buildings – financing to comply with/meet a number of standards applicable to green buildings such as:

- IFC certification for Excellence in Design for Greater Efficiencies (EDGE)
- Local green building certification system
- Leadership in Energy and Environmental Design (LEED) certification issued by the US Green Building Council
- BRE certification for the environmental assessment method (BREEAM) defined by the Building Research
- Bronze, silver or gold issued by the German Sustainable Building Council (DGNB)
- RoGBC certification or other types of certifications

Special environmental financing or technological investments (according to EBRD)

- Products or equipment
- Low-carbon technologies, including R&D (e.g., smart irrigation systems)
- Reduction of non-energy GHG emissions: fugitive emissions, carbon capture and storage, lower emissions from industrial processes

Climate change adaptation

- reduce vulnerabilities to the effects of climate change and increase the capacity to adjust to the new environment Agriculture (e.g., investments for adapting to the new meteorological conditions and extreme climatological events with the help of irrigation, desiccation and drainage, prevent soil erosion and restore soil quality, prevent desertification, conduct research to cut water waste or GHG emissions, extend the ecologically certified areas, agri-environment measures (afforestation, forest covers, eco-conditionality, biomass certification, etc.).

