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## Second Party Opinion

# Government of Romania's Green Bond Framework

Dec. 20, 2023

**Location:** Romania

**Sector:** Sovereign

## Alignment With Principles

Aligned = ✓ Conceptually aligned = ○ Not aligned = ✗

✓ Green Bond Principles, ICMA, 2021 (with June 2022 Appendix 1)

See [Alignment Assessment](#) for more detail.

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**Medium green**

Activities that represent significant steps towards a low-carbon climate resilient future but will require further improvements to be long-term low-carbon climate resilient solutions.

Our [Shades of Green Analytical Approach](#) >

## Strengths

**The framework's eligible expenditures align well with Romania's national policy objectives, as well as the EU's regional targets and strategies on climate, biodiversity, waste, and adaptation.** For example, it bolsters the transparency of Romania's transition plan and its long-term energy and climate strategy (LTS) and includes robust decarbonization targets.

**Romania commits to obtaining independent verification that it has fulfilled the eligibility criteria for cogeneration/combined heat and power (CHP) from natural gas.** These criteria contain several quantitative thresholds; for example, emission intensity must be less than 270 gCO<sub>2</sub>e/kWh, and the investments must lead to at least a 55% reduction in emissions per kWh of output energy. We view the requirement for external independent verification as positive, considering the high transition risks associated with such projects.

## Weaknesses

**Romania's Green Bond framework includes investments in, and exposure to, fossil fuel-based assets and infrastructure.** First, some proceeds will finance investment in making the country's gas distribution network ready for hydrogen and low-carbon gases. Second, proceeds will finance the conversion of coal-powered electricity generation to CHP plants running on natural gas, with plans to switch to non-fossil-fuel gases at a later stage. Until the network distributes, and the CHP plants run on renewable or low-carbon gases, these expenditures will be exposed to significant transition risk. However, expected allocation to these categories will represent a minor share of total proceeds. Additionally, under Romania's LTS, all natural gas-powered plants will be 100% ready for renewable gases by 2036 and all coal and lignite-powered capacities will be closed by 2031.

## Areas to watch

**The broad scope of the framework and numerous project categories create some uncertainty when it comes to the specific future projects that will be eligible under the framework.** Several project categories, including energy efficiency and sustainable water and wastewater management, have more broadly defined criteria and lack a specific energy efficiency threshold to determine eligibility. Furthermore, we note that Romania has not committed to providing a comparative assessment between the most cost-effective and technically feasible renewable alternatives and CHP plants running on natural gas.

## Eligible Green Projects Assessment Summary

Eligible projects under the issuer's green finance framework are assessed based on their environmental benefits and risks, using the Shades of Green methodology.

### Renewable Energy Medium to Light green

Investment and expenditure (including subsidies/grants) in the generation and transmission of renewable energy, including:

- Projects supporting the integration of renewable energy into the power grid: retrofitting gas transmission and distribution networks to enable the integration of hydrogen and other low-carbon gases into the network, or the use of smart energy grids and smart meters; and
- Research and development of products or technology to generate renewable energy, including the manufacture of wind turbines and solar panels.

### Energy Efficiency Light green

Investment and expenditure in energy-efficiency improvements to infrastructure that result in energy consumption being below the average national energy consumption of equivalent infrastructure.

Research and development, and implementation, of products or technology that reduce the energy consumption of underlying assets, technology, products, or systems, including LED lights, improved chillers, improved lighting technology, district cooling and heating, smart grids, and heat recovery.

Conversion of thermal plants to CHP gas power plants, where certain emissions thresholds and other requirements are met.

### Pollution Prevention and Control Medium to Light green

Investment and expenditure in projects dedicated to reducing land pollution and waste generation, including waste prevention; waste collection and management; product recycling and reuse; waste-to-energy activity, with materials recovery and recycling prior to incineration and soil remediation.

Investment and expenditure in projects dedicated to reducing air pollution and greenhouse gas (GHG) emissions control.

### Clean Transportation Dark green

Investment and expenditure in clean transportation systems and related infrastructure that reduce GHG emissions in transportation.

Investment in transportation infrastructure for mass transit, such as the expansion of train/metro networks, projects related to capacity improvement, or station upgrades.

### Sustainable Water and Wastewater Management Light green


Investment and expenditure in projects and infrastructure dedicated to reducing water consumption; sustainably managed water resources; and reducing water pollution, including developing and improving water supply and management infrastructure and urban drainage.

**Climate Change Adaptation**

 **Dark green**

Investment and expenditure in projects and infrastructure that would reduce risk exposure and/or limit the severity of the impact of physical climate hazards, such as flood early warning systems; flood control systems; drought management projects; infrastructure for disaster resilience; and the upgrade of the transportation network to higher, climate-resilient design standards.


**Green Buildings**

 **Medium to Light green**

Investment and expenditure in internationally, regionally, and nationally certified green buildings, including construction of new buildings or renovation of existing buildings (including public service, commercial, residential, and recreational).

Investment and expenditure in building retrofits that lead to an increase of at least 30% in the energy efficiency of buildings.

**Environmentally Sustainable  
Management of Living Natural  
Resources and Land Use**

 **Medium to Light green**

Investment and expenditure related to the acquisition, maintenance, and sustainable management of natural resources such as land, water, air, minerals, forests, and wild flora and fauna

See [Analysis Of Eligible Projects](#) for more detail.

## Issuer Sustainability Context

This section provides an analysis of the issuer's sustainability management and the embeddedness of the financing framework within its overall strategy.

### Entity Description

Romania is a member of the EU in the southeastern part of Europe. It has a surface area of 38,397 square kilometers and a population of 19.41 million. The country has a very high Human Development Index (HDI) of 0.821 (as of 2021) and a mixed economy, with a skilled labor force. Romania is a high-income country with a GDP per capita of around US\$17,700 in 2023, according to Eurostat. Its main exported goods include vehicles and machinery, chemical goods, as well as electronic and electrical equipment.

Romania possesses a diverse set of natural resources that includes fertile land for agriculture, pastures for livestock, forests that provide hard and soft woods, petroleum and gas reserves, and metals. Forests cover about one-third of Romania's surface area and are an important component of the vegetation cover, particularly in the mountains.

### Material Sustainability Factors

#### Climate Transition Risk

Policymakers have a key role to play in bringing about the drastic cuts in GHG emissions needed to address climate change. While the breadth of existing country signatories to the 2015 Paris Agreement provides a basis for global action, current climate pledges fall significantly short of the reductions needed to reach net zero by 2050. A lack of policies to support climate pledges exacerbates the challenge, making it likely that warming could exceed 1.5 °C compared with pre-industrial levels in the near future, based on past emissions and current trends. Indeed, current commitments are expected to result in a broadly constant level of global emissions of about 60 Gt carbon dioxide-equivalent a year. As a result, warming is likely to exceed 3 °C by the end of the century.

Governments can stimulate climate action from public and private, personal, and industrial actors through regulations, incentives, and various price signals--including broad and material carbon taxes, subsidies, and penalties. Countries also have widely different contributions to past, current, and future global emissions, both on an absolute and per capita basis, with historical economic development closely linked to the use of fossil fuels and resulting emissions. Policymakers' incentives to act on climate vary widely and can change rapidly with the level of public support for action; international agreements; tangible evidence of climate change in the region; short-term economic costs of the transition; social acceptance; competitive pressures; the perceived impact a country or region can have on global emissions; and the perceived imbalance between local and global risks from climate change.

As an EU member state, Romania is part of the bloc's green transition plan, including the joint nationally determined contribution (NDC) of the EU, revised in 2023. This NDC requires member states to jointly reach a 55% net reduction in greenhouse gas emissions by 2030, from 1990 levels. To achieve this climate goal, the EU is implementing its "Fit for 55" package, a set of measures and policies affecting many sectors, which are likely to induce material and structural changes to Romania's economy. Within this revised NDC, as per the Effort Sharing Regulation (ESR), by 2030, Romania will need to reduce by 12.7% (from 2005 levels) its emissions in the ESR sectors: domestic transport (excluding aviation), buildings, agriculture, small industry, and waste.

#### Physical Climate Risks

Physical climate risks can affect many economic activities, absent adaptation. If GHG emissions increase and are unabated, this will drive more frequent and severe climate hazards. Although the physical impact of climate change and extreme weather events will continue to play out globally, the direct impact of climate hazards--including heat waves, flooding, and wildfires--are typically localized. Meanwhile, the indirect impact of such events may precipitate through different channels (such as the volume and pricing of traded goods and services), extend beyond administrative borders, and cascade through multiple sectors.

Romania's topography and landscape include mountains (35%), hills and plateaus (35%), and plains (30%). The Black Sea stretches along the country's eastern border and Romania also encompasses the Carpathian Mountains, Transylvania Alps, and the Danube river. As a result of its geographical diversity, the country is exposed to a range of potential physical climate effects, such as seasonal flooding and periods of drought. According to the World Bank, more than half of the natural hazards that occurred in Romania between 1980 and 2020 were floods and about 20% were related to extreme temperatures. Droughts may become more frequent in some areas due to changing rainfall patterns and reduced precipitation runoff. Wildfires are also considered to be a critical hazard for the country, given that forests cover about one-third of the total land.

### Other Environmental Risks

Governments play a key role in protecting biodiversity, and containing land, air, and water pollution. Economic development goals may exert considerable pressure on natural ecosystems, locally and at trading partners. Environmental factors are often intertwined with other factors, such as climate transition and physical climate risks.

Romania is exposed to other environmental factors, including water, land use, and biodiversity. The country's diverse landscapes and biomes translate into rich species diversity. The EU's target, under its biodiversity strategy, is to reach 30% of protected land areas by 2030. In Romania, 23.4% of the country and 21.4% of its marine waters is currently covered by protected areas. Agriculture remains a material source of environmental pollution in rural areas across Romania. The country's municipal landfill rate has remained relatively high for the past 10 years. In 2020, it stood at 74% of the EU's 2025 targets for municipal and packaging waste, according to a report on Romania's progress by the European Commission and European Environmental Agency (EEA). The EU aims to reduce this landfill rate to 10% by 2035.

### Social Risks

Governments play a crucial role in ensuring the development of society and economy. Depending on national and local socioeconomic circumstances, governments may prioritize issues of economic advancement, poverty, hunger, or inequality reduction, access to essential services or infrastructure, access to clean water and sanitation, or other social goals.

Romania is a high-income economy with an HDI of 0.821 (2021), ranking 53rd out of 191 countries. The country has made significant progress in improving its prosperity throughout the past decades, though challenges remain. For example, it still has one of the highest rates of poverty and inequality in the EU. Access to and the affordability of essential services, such as access to water and housing, can severely influence local communities' livelihoods, especially for people in rural regions and low-income populations.

Notably, in its April 2023 briefing "Understanding EU action on Roma inclusion," the EU estimates that about 30% of Europe's Roma people live in Romania. The Roma people, Europe's largest ethnic minority, are particularly exposed to social risks, including inadequate living conditions and access to health care, low incomes, high unemployment, and discrimination in access to education. In early October 2020, the EU Commission adopted the "EU Roma strategic framework for equality, inclusion and participation (2021-2030)," which supports various projects and programs aimed at tackling these social issues. Romania also approved its Integrated Strategy for Roma People 2022-2027, which aims to improve the Roma people's socioeconomic condition.

## Issuer And Context Analysis

**The eligible project categories aim to address Romania's material sustainability factors, including climate transition and physical climate risk.** Expenditures include projects within categories such as renewable energy, energy efficiency, clean transportation, and green buildings. All of these aim to address climate transition risk, with some projects in the pollution prevention and control and sustainable water and wastewater management also addressing waste issues. These projects align with the "Green Transition" pillar of the country's National Recovery and Resilience Plan (NRRP), which details the priority areas for investments in Romania for 2021-2026.

**The financed projects support the issuer's overall climate and environmental strategy, but the role of natural gas in the country's energy transition could carry short-to-medium term risks.** In its long-term strategy, Romania aims to reach a 78% emission reduction by 2030, relative to 1990

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levels. The country's largest source of emissions are its energy industries, which account for nearly 69% of total emissions. These comprise electricity or heat production plants (29% of the total country emissions) and transport (25%). The country's economy has significantly decarbonized in the past 30 years--emissions in 2019 were 62% lower than in 1990, largely because of reduced emissions in the energy and industrial sectors. That said, the pace of change has slowed materially in the past decade and the reduction between 2010 to 2019 was only 10%. Romania's total energy supply is heavily reliant on fossil fuels, which provided 71% of its total energy supply in 2020 (according to the International Energy Agency's [IEA] World Energy Balances). The major sources of energy are oil and natural gas, each of which provided 30% of the total in 2020; coal made up 11%. In addition, biofuels and waste comprised 12% and nuclear stood at 9%. Hydro, wind, and solar collectively represented 6% of Romania's total energy supply. According to Romania's NRRP, the country aims to phase out coal by 2032 and to replace it with natural gas in the medium term, which could create lock-in emission risks. As part of its National Hydrogen Strategy, Romania intends to make all of its natural gas-powered plants 100% ready for renewable gases (green hydrogen specifically) by 2036.

**Due to its diverse geography, Romania faces a broad range of intensifying weather events related to climate change, including floods, droughts, and soil erosion.** The effects have been felt across various sectors, in particular agriculture, energy, and forestry, prompting the country to develop a national adaptation framework to support its climate resilience efforts. Moreover, the country has put in place a flood risk management plan and a national basin management plan. Under its NRRP, Romania has also identified various measures specifically intended to address the impact of climate change on water availability. Nevertheless, further efforts are required to address Romania's vulnerability to climate change and natural disasters, including additional investments and improved cooperation and capacity across different levels of government.

**Air and water pollution, alongside threats to biodiversity, constitute significant environmental issues in Romania.** The country's manufacturing facilities, chemical plants, and power plants rely heavily on the burning of fossil fuels, resulting in high levels of emissions, including sulfur dioxide, which produces acid rain. In addition to causing air quality problems, industrial runoff may end up in the Danube River system, which can affect water quality and damage river ecosystems. Aside from pollution, biodiversity in the country is threatened by urban sprawl, desertification, the overexploitation of natural resources, and illegal logging activities. In response, Romania will have to undertake relevant measures in line with the EU's biodiversity strategy for 2030, such as increasing protected areas and implementing management plans for its Natura 2000 sites.

**While not the primary objective, measures to address climate change mitigation and adaptation may have substantial effects on local communities and livelihoods.** Potential benefits may include reduced air pollution and improved access to essential infrastructure and services. We also note that the proportion of the country's workforce employed in agricultural activities is high, compared with other European countries. Considering the materiality of this sector in the country, it will be critical for Romania to manage a socially just and fair transition. This will require the country to effectively balance land use requirements for food production with the increasing pressure to protect biodiversity and produce energy from renewable sources. At the same time, the intensifying effect of climate change will have substantial social and economic ramifications, especially in rural areas, which are highly vulnerable to the increased incidence of flooding, droughts, and other extreme weather events.

# Alignment Assessment

This section provides an analysis of the framework's alignment to the Green Bond Principles.

## Alignment With Principles

Aligned = ✓ Conceptually aligned = ○ Not aligned = ✗

✓ Green Bond Principles, ICMA, 2021 (with June 2022 Appendix 1)

### ✓ Use of proceeds

All the framework's green project categories are shaded in green, and the issuer commits to allocate the net proceeds issued under the framework exclusively to eligible green projects. Please refer to analysis of eligible projects section for more information on our analysis of the environmental benefits of the expected use of proceeds. The issuer commits to allocate the proceeds to finance assets, capital expenditure, and operating expenditure, including research and development expenses. Eligible green projects have a three-year lookback period for refinancing. The issuer also commits to a three-year lookforward period for newly financed projects, which we view favorably. The framework excludes projects such as fossil fuel-based power generation (except CHP gas power plants that meet the criteria set out in the framework) and transportation, nuclear power, landfill projects, and defense investments.

### ✓ Process for project evaluation and selection

A committee comprising the state secretary or director from 13 ministries, chaired by the minister of finance, will evaluate, select, and approve projects and expenditure. Ministries will compile an initial list of potential green projects based on the eligibility criteria and their level of preparedness (1= ready for investment, 2= under development, 3= under conceptualization). Each month, or as needed, the committee will evaluate the submitted projects to ensure compliance with the framework. All projects under the framework are subject to an impact assessment, which draws on national and European laws and guidelines and considers the environmental and social risks of the projects during their construction and operation phases.

### ✓ Management of proceeds

The general directorate of treasury and public debt within the ministry of finance is responsible for issuing the green bonds and will manage the allocation of an amount equivalent to the net proceeds of these bonds, using a portfolio approach. The ministry of finance commits to track the proceeds through a green financing register which will include the details of the green bonds, proceeds generated, and allocations made to eligible green projects, including information about the projects. If any projects to which funds were allocated are removed from the portfolio, Romania will strive to find suitable replacements on a best-effort basis within 12-24 months. Any unallocated funds will be managed according to prudential liquidity policies appropriate to a sovereign and held in cash or cash equivalent instruments. The issuer specifies that unallocated proceeds will not be invested in any of the activities in the framework's exclusion list.

### ✓ Reporting

An annual allocation and impact report will be available to investors on the ministry of finance's website ([www.mfinante.gov.ro/en/web/trezor](http://www.mfinante.gov.ro/en/web/trezor)) until full allocation of the outstanding green bonds. The issuer commits to report on the expected environmental and/or social effects of the projects, subject to the availability of the relevant data. Romania intends to align with ICMA's Harmonized Framework for Impact Reporting on a best-efforts basis; this is in line with best market practice.

The general directorate of treasury and public debt within the ministry of finance will be responsible for the preparation and coordination of the post-issuance allocation and impact reports. Additionally, in case of any material changes, Romania commits to update investors on a timely basis. Finally, the issuer confirms that an assurance report on the allocation of green bond proceeds to eligible green projects will be provided by an external reviewer.

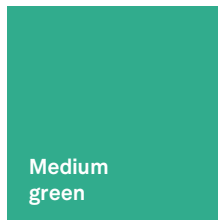
# Analysis Of Eligible Projects

This section provides details of our analysis of eligible projects, based on their environmental benefits and risks, using the Shades of Green methodology.

The issuer's estimated projected allocations on a portfolio basis indicate that a large majority of proceeds will be allocated to the clean transportation, climate change adaptation, and sustainable water and wastewater management project categories. Projects within the renewable energy and energy efficiency categories are expected to receive only a minor share of proceeds.

## Overall Shades of Green assessment

Based on the expected allocations, as well as the project category shades of green detailed below, and consideration of environmental ambitions reflected in Romania's Green Bond Framework, we assess the framework to be medium green.



Activities that represent significant steps towards a low-carbon climate resilient future but will require further improvements to be long-term low-carbon climate resilient solutions.

Our [Shades of Green Analytical Approach](#) >

## Green project categories

### Renewable energy

#### Assessment

 **Medium to Light green**

#### Description

- Investment and expenditure (including subsidies/grants) in generation and transmission of renewable energy, including:
  - Solar photovoltaic (PV) and solar thermal heating;
  - Onshore and offshore wind energy facilities;
  - Hydropower, which meets any of the criteria below:
    - Life cycle GHG emissions of less than 100g CO<sub>2</sub>e/kWh;
    - Power density greater than 5 watt per square meter; and
    - Run of river plant and does not have an artificial reservoir.
  - Bioenergy derived from biofuel or biomass;
  - Green hydrogen produced using renewable energy, which meets the criteria of life cycle GHG emissions below 100g CO<sub>2</sub>e/kWh;
  - Projects supporting the integration of renewable energy into the power grid: retrofitting of gas transmission and distribution networks that enables the integration of hydrogen and other low-carbon gases in the network, smart energy grids, and smart meters. Projects will include mandatory leak detection and repair of existing pipeline and network elements to minimize methane leakage; and
  - Research and development of products or technology for renewable energy generation, including the manufacture of wind turbines and solar panels.

## Analytical considerations

- Romania's long-term strategy is to reduce emissions by 78% by 2030, relative to 1990 levels. The country has made progress through its decarbonization plan and by 2019 had reduced net emissions by 62% (compared with 1990). We believe the renewable energy projects in this category directly contribute to the achievement of the country's long-term objective. However, in addition to solar and wind power projects, hydropower, green hydrogen, and bioenergy, the framework also includes power



grid and retrofitting projects to make natural gas pipelines hydrogen-ready. Given that these natural gas network retrofitting projects receive a light green shade, the overall assessment of the category is limited to light to medium green.

- We consider Romania's investments in retrofitting its existing gas infrastructure as light green because of the particularly high emissions lock-in risks, compared with renewable projects, and other technical challenges. According to the issuer, the gas mix distributed in the retrofitted pipelines will comprise 30% to 70% green hydrogen by 2030. While the IPCC reports highlight the importance of green hydrogen in achieving energy transition goals, especially in hard-to-abate industrial sectors, we believe potential operational challenges could limit environmental benefits.
- According to research by the Argonne National Laboratory, blending 30% hydrogen by volume into gas pipelines yields only a 6% decrease in life cycle greenhouse gas emissions. Since hydrogen has one-third of the energy density of methane, pipeline operators must replace a standard cubic foot of gas with three standard cubic feet of hydrogen to deliver the same amount of energy to end users. This leads to material challenges; in particular, the increased likelihood of pipeline leakage and increased demand for energy during the transmission and distribution phase. Indeed, pipeline operators need to increase compression rates to provide the same level of energy when the mix has more hydrogen than methane. The increase in compression will consume more energy. These challenges can strongly limit the life cycle environmental benefit of the project, in our view.
- The issuer confirmed to us that eligible projects will include retrofits of existing gas pipelines only, not new pipelines. In addition, retrofitted pipelines will not be connected to any new gas field production projects. By adapting the existing infrastructure, the government incentivizes the production of low-carbon gas alternatives in the country. Nonetheless, natural gas plays a material role in the country's transition plan and new gas fields are being developed in the Black Sea. Additionally, such projects will require end users, such as industrials and residential customers, to upgrade their networks as well. This adds to the complexity and short-term environmental impact. Although the framework states that projects will also include leak detection and repair of existing pipelines, as well as network elements to reduce methane leakage, we believe this does not fully mitigate the above risks. Additionally, the issuer may not have direct control over the implementation of mitigating measures because a range of private sector parties will be involved in this transition.
- Regarding hydropower, projects will have to meet the same criteria as expressed in the EU taxonomy criteria. We view this as positive, given that large hydropower facilities and their associated construction and renovation projects can affect the surrounding environment and biodiversity. Similarly, we also view favorably that hydrogen is only eligible under the framework if it is produced from a renewable energy source that meets the criteria of life cycle GHG emissions below 100g CO<sub>2</sub>e/kWh.
- We view as positive that the production of bioenergy is limited to waste-based feedstock, mainly sawdust and residues resulting from wood processing. In line with the Annex V and VI of the EU's renewable energy directive (Directive (EU) 2018/2001 - RED II), Romania expects GHG emissions savings of 80% for bioenergy and of 65% for biofuels used for transport, compared with their fossil fuel comparators. A tracking system will be used to monitor the origin of the feedstock. The framework also specifies that feedstock production cannot take place on lands that act as a carbon sink (such as forests, wetlands, or peatlands) and in protected areas. Although feedstock is to be waste-based, we note that bioenergy production would still be indirectly dependent on activities that could be affected by changes in land use.
- The issuer informed us that it will require projects receiving financing to fill in a dedicated section covering how their projects address the "do no significant harm" criteria in the EU taxonomy (art. 17 of Regulation (EU) 2020/852) in their application form. That said, there is no requirement to track harm done during the procurement of raw materials for eligible projects. Given the minerals critical to renewable power and storage projects, this represents an area to watch, in our view. In addition, the framework does not directly address end-of-life treatment of such assets. This could represent a pollution risk in the long term because the component materials are difficult to recycle.
- Renewable energy and grid infrastructure projects typically require a change in land use and therefore carry biodiversity and local environmental risks. In line with Romania's transposition of the EU's environmental impact assessment (EIA) directive; solar, wind and hydro projects, as well as heat pumps that require deep drilling, will be subject to a screening to determine their potential environmental impact. The issuer has confirmed that physical climate risks would be considered at the project level. However, we note the absence of commitments on resilience as an area to watch, considering the size of some of the projects that are potentially eligible.

## Energy Efficiency

### Assessment

 Light green

### Description

- Investment and expenditure in energy-efficiency improvements of infrastructure that result in energy consumption below the average national energy consumption of equivalent infrastructure.
- Research and development, and the implementation, of products or technology that reduce the energy consumption of underlying assets, technology, products, or systems, including LED lights, improved chillers, improved lighting technology, district cooling and heating, smart grids, and heat recovery.
- Conversion of thermal plants to CHP gas power plants where:
  - Life cycle emissions are below 100g CO<sub>2</sub>e/kWh; or
  - Until 2030 (date of approval of construction permit) the following is verified each year by an independent third party:
    - Primary energy savings of at least 10%;
    - Direct GHG emissions are <270g CO<sub>2</sub>e/kWh;
    - Leads to reduction in emissions of at least 55% of GHG per kWh;
    - Power and heat to be replaced cannot be sufficiently generated using renewable energy sources;
    - Newly installed production capacity does not exceed capacity of replaced facility;
    - Switch to full use of renewable and/or low-carbon gaseous fuels to take place by Dec. 31, 2035;
    - Projects will include mandatory leak detection and repair at construction; and
    - At operation, physical emissions are reported and any leak is eliminated.

### Analytical considerations

- The project category receives a Light Green shading because some of its expenditures include the conversion of coal and oil fuel power plants to CHP natural gas plants, which can be considered transitional investments given the eligibility criteria and Romania's transition plan. We recognize the reduction in emissions due to the switch to natural gas from more-emissive energy sources, and the reduced energy losses thanks to cogeneration. However, we believe the transition risks from investing in natural gas power and heat generation are material. Natural gas investments are not aligned with a future in which warming is less than 1.5 °C. It is therefore crucial to the shading that the eligibility criteria require Romania to commit to combusting only renewable or low carbon gases by Dec. 31, 2035.
- The IEA 2023 World Energy Outlook states that, under its Stated Policies Scenario (STEPS), global demand for all fossil fuels is set to peak by 2030. It also highlights that, in the electricity sector, worldwide additions of coal- and natural gas-fired power plants have halved, at least, from earlier peaks. We view this as another indication that new investments in fossil fuel-based power plants represent an increasing risk of stranded assets. Despite their lower emissions intensity compared with coal power plants, the converted cogeneration power plants will still burn natural gas to operate, leading to GHG emissions and air pollution.
- The country context and its long-term strategy are considered when assessing such projects. In 2022, 19% of Romania's electricity generation relied on coal, while natural gas accounted for 18% of the mix. The main power sources were hydro (25%) and nuclear (20%), while solar and wind made up around 16%. In its long-term strategy, Romania plans for all natural gas-powered plants to be 100% ready for green hydrogen by 2036 and all coal and lignite-powered capacities to be closed by 2031. We view this as partly mitigating the high transition risk of these expenditures. Indeed, the framework also commits on the

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readiness of its financed CHP plants to combust hydrogen, renewable, or low carbon gases, and to switch to renewable and/or low-carbon gases by Dec. 31, 2035.

- The eligibility criteria require that the activity leads to a reduction in emissions of at least 55% and direct emissions of the activity must be lower than 270g CO<sub>2</sub>e/kWh. For cogeneration of heat/cool and power from natural gas, another framework requirement is that primary energy savings be at least 10% compared with separate heat and electricity production. Although we view the inclusion of these requirements as positive, the issuer did not share further information on how this is to be met for eligible projects.
- The eligibility criteria also require that the activity replaces a high-emitting power and heat activity, and that the capacity of each facility is not increased. The eligibility criteria require that the heat and power that is being replaced cannot be generated from renewable energy. This is important, given the use of natural gas for the cogeneration of heat/cool and power, or the production of heat/cool, should only be considered if renewable alternatives are unfeasible, and the risk that such investments could impede the development of renewable sources. Moreover, the substantial contribution criteria in the EU taxonomy require that such projects prepare and publish a comparative assessment with the most cost-effective and technically feasible renewable alternatives for the same capacity, and subject it to a stakeholder consultation. This commitment is absent from the framework and we believe this would make the framework more robust. Nonetheless, when assessing this project, we also considered Romania's target regarding the share of renewable energy in the gross final energy consumption. The country aims for this renewable energy share to reach 89.9% in 2050 and 36.3% in 2030, according to the "Romania Neutral" scenario (6% of total energy supply as of 2020, according to the IEA). In our view, this partly mitigates the risk that a lack of a comparative assessment could limit the development of renewable sources in the country.
- Other eligible projects include increasing the electricity network efficiency and flexibility, through additional battery storage solutions, digitization systems for energy consumption monitoring, and installation of charging stations for electric vehicles. Although we view these projects positively, the eligibility criteria lack an energy-efficiency improvement threshold, which constitutes a limitation.

### Pollution Prevention And Control

#### Assessment

 **Medium to Light green**

#### Description

- Investment and expenditure in projects dedicated to reducing land pollution and waste generation, including waste prevention; waste collection and management; product recycling and reuse; and waste to energy activity, with materials recovery and recycling prior to incineration and soil remediation.
- Investment and expenditure in projects dedicated to reducing air pollution and GHG emissions control.

### Analytical considerations

- According to the European Environment Agency, the municipal recycling rate in 2020 in Europe was 48.6%, while Romania's stood at 13.7%. Considering the EU's target for member states to recycle and prepare for reuse 55% of their municipal waste in 2025, the waste sorting and collection projects in this category will be key to improve the country's likelihood to reach that target. The issuer excludes any landfill financing from this project category. Although the absence of an emissions threshold is a limiting factor for waste-to-energy projects, in our view, the issuer informed us that no such projects had been identified so far.
- Close to 14,000 digitalized ecological islands are to be financed, each serving at least 200 inhabitants, to ensure the separate collection of household waste. This will be complemented by more than 500 voluntary collection centers, which plan to serve communities of around 50,000 inhabitants. These centers will be used for the separate collection of waste which is out of scope for the standard collection system, including electrical and electronic equipment and hazardous waste. In our view, these projects will improve collection and sorting rates, which is positive because we consider efficient waste sorting to be a key step toward improving reuse and recycling rates.
- That said, under the EU's waste hierarchy, sorting and collection projects would need to be implemented in combination with other key steps. These include actions to increase capacity for reuse and recycling, as well as efforts to prevent waste generation at the product or packaging design phase, or through the promotion of sustainable production and consumption models, for example.

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- The issuer also plans to use the proceeds to finance equipment used for monitoring air, radioactivity pollution, and noise levels, as well as the verification and supervisory activities needed to implement the EU Emissions Trading System (ETS) scheme. These projects will strengthen the country's ability to measure pollutant concentrations and its environmental data collection and reporting capabilities. We view additional monitoring capabilities positively because this will inform the government's actions and facilitate implementation of its policies. Nevertheless, in isolation, this project will have no direct environmental benefits in the short term. Therefore, we assign these projects a light shade of green, while the investments dedicated to waste collection and sorting capabilities are assigned a medium shade of green.
- Eligible projects also include soil remediation, which refers to restoring soil quality or mitigating the presence of contaminants in soil, which we view positively, considering the impact on local population health and local biodiversity.

### Climate Change Adaptation

#### Assessment

 Dark green

#### Description

Investment and expenditure in projects and infrastructure that would reduce risk exposure or the severity of the impact of physical climate hazards, such as flood early warning systems; flood control systems; drought management projects; infrastructure for disaster resilience; and the upgrade of transportation network to higher, climate-resilient design standards.

#### Analytical considerations

- The eligible projects in this category mainly aim to increase the country's resilience to two key physical risks, flooding and droughts. While Romania is increasingly exposed to both, droughts specifically affect the south, southeast, and east parts of the country. Considering the relatively high share of the workforce in the agricultural sector compared with other EU countries, we believe such physical climate events could significantly affect Romania's economy and its inhabitants' livelihoods.
- In line with the EU floods directive, the country updated its national flood risk management plan and aims to allocate proceeds to finance the rehabilitation of more than 500 kilometers of flood defenses. Considering biodiversity and carbon sequestration co-benefits, it is positive that the issuer informed us that projects will prioritize nature-based solutions. For example, while some dams will be rehabilitated when no feasible alternatives are identified, others will be replaced by nature-based solutions, when this has been identified as the best option. Such solutions could include, for instance, restoration of wetlands and natural water retention areas to mitigate the impact of floods. The issuer informed us that rehabilitation projects will be completed in line with the assessment requirements from the relevant EU policies, such as the environmental impact assessment, water framework, and habitats directives. Other projects include measures to improve flood monitoring and warning systems and measures to improve public awareness of flood preparedness, which also contribute to greater resilience.
- The issuer also aims to finance projects to increase the country's resilience to droughts, mainly through the rehabilitation and establishment of irrigation and drainage infrastructure. This includes the creation of new reservoirs and the expansion of existing ones, as well as the implementation of solutions to collect rainwater. More holistically, regarding water quality and irrigation needs, other measures aim to improve agricultural and forestry land management practices. This includes for example the promotion of drought resistant crops and organic farming, which we view as a positive mitigating factor to preserve the quality and quantity of water resources in times of droughts.
- This project category is assigned a dark shade considering the critical need for increased resilience and adaptation measures in light of the increasing frequency of physical climate risks. However, some fossil-fuel based machinery and equipment will be used during the execution phase, for demolition, construction, or transport, which will lead to some GHG emissions. The issuer confirmed that expenditure that prolongs the life of fossil fuel-based infrastructure (such as roads) and operations are not eligible and that investments in this category would only finance adaptive measures, not infrastructure itself.

## Clean transportation

### Assessment

 Dark green

### Description

Investment and expenditure in clean transportation systems and related infrastructure that reduce GHG emissions in transportation, such as:

- Zero-carbon transport: investments in passenger and freight vehicles with zero tailpipe emissions, such as electric cars, hydrogen cars, and electric trains; and
- Low-carbon transport.
  - Investments in low-carbon passenger vehicles with tailpipe emissions intensity of up to 50g CO<sub>2</sub>/km until 2025 (from 2026 onward, only vehicles with emission intensity of 0g CO<sub>2</sub>/km are eligible):
- Investments in infrastructure to support the use of zero-carbon and low-carbon vehicles.

Investments in transportation infrastructure for mass transit (expansion of train/metro networks, projects in relation to capacity improvement, and station upgrades).

### Analytical considerations

- Electrification and supporting infrastructure play a key role in decarbonizing the transport sector to align with a 2050 future. However, there are also potential risks related to indirect GHG emissions from a life cycle perspective (material sourcing, manufacturing), as well as fossil fuel-generated electricity for charging. As of 2022, the Romanian electricity mix consisted of roughly 26% hydropower, 20% nuclear, 19% coal, 19% gas, 15% renewables, and 1% biomass.
- Most eligible expenditure concerns the modernization and electrification of railway infrastructure, as well as the purchase of new rolling stock with zero tailpipe emissions. The issuer similarly intends to finance various mobility solutions, including the purchase of clean vehicles (for example, trams and electric buses) and the construction of cycling paths, EV charging infrastructure and a new metro line.
- The issuer confirms that transportation infrastructure, including railway and metro lines, as well as the acquisition of rolling stock, focus on fully electrified modes of transport exclusively. This expenditure is considered crucial to the transition from individual transportation modes, particularly fossil fuel-based, to public transportation that has zero direct (tailpipe) emissions. Furthermore, rail infrastructure that is dedicated to transporting fossil fuels (for example, port/terminal connections) will not be eligible.
- The relevant ministries undertake feasibility studies for investments into rolling stock that consider environmental impacts, with similar assessments being conducted for railway infrastructure. Like all expenditures under the framework, transportation projects will undergo an EIA in line with national legislation before being carried out.
- Although the issuer does consider elements such as the use of sustainable materials for the construction of its metro system specifically, there is no systematic approach to addressing life cycle emissions in the procurement process for financed assets and activities. In particular, the production of batteries for EVs and the sourcing of raw materials can have substantial climate and environmental impacts along the value chain.
- In line with the requirements applicable to all relevant assets under the framework, the issuer confirms that it will conduct a climate risk and vulnerability assessment to better understand the potential effect of climate change on the asset's performance and durability across the entire life cycle of the investment. Infrastructure projects are subject to additional considerations related to seismic and flooding risks, through the relevant regulatory frameworks.
- Financed infrastructure projects will be subject to an EIA, in line with the requirements of Romanian law no. 292/2018, based on EU Directive 2011/92/EU.

## Sustainable water and wastewater management

### Assessment

 Light green

### Description


Investment and expenditure in projects and infrastructure dedicated to reducing water consumption; sustainably managing water resources; and reducing water pollution, including developing and improving water supply and management infrastructure, and urban drainage.

### Analytical considerations

- Efficient water and wastewater activities, both in terms of energy and water, are generally positive both for climate resilience and pollution prevention reasons, and investments in these sectors are needed to meet the 2050 goals. As previously mentioned, Romania faces risks linked to water pollution and the inefficient use of water resources. It is also vulnerable to climate change impacts such as floods and droughts, which may affect the availability and quality of water in the future. Eligible expenditure under Romania's Green Bond Framework include general financing toward the construction of water supply and wastewater infrastructure. The issuer has not included specific thresholds related to energy consumption for the different types of project within this category; therefore, the overall assessment of the category is limited to light green.
- Untreated sewage threatens water quality, and new and or improved wastewater infrastructure, including treatment and disposal systems, are important to prevent pollution. Best practices include applying a circular economy approach to the water treatment process, by using as much of waste streams as possible, such as utilizing sewage sludge for biogas production or reusing extracted nitrogen. Romania has established a National Strategy for the Circular Economy (NSCE), which covers the wastewater sector and requires partial utilization of sludge from sewage treatment plants, according to the issuer.
- The issuer has confirmed that no water-related infrastructure expenditure will exclusively support emission-intensive sectors. Similarly, none of the financed water or wastewater activities will involve the use of fossil fuels (for example, the use of fossil fuel-powered pumps).
- As with all projects under the framework, the issuer will conduct an EIA for relevant water supply and wastewater systems, which it says will include considerations related to GHG emissions in both the construction and operational phase (for example, the use of chemicals), as well as the effect on water basins and local ecosystems.

## Green buildings

### Assessment

 Medium to Light green

### Description

Investment and expenditure in internationally, regionally, and nationally certified green buildings, including construction of new buildings or renovation of existing buildings (including public service, commercial, residential, and recreational). Some of the certifications and potential projects are listed below:

- Obtaining a minimum certification of "BREEAM Excellent," "LEED Gold," or a similar recognized standard; and
- For buildings built after Dec. 31, 2020, having primary energy demand at least 20% below that resulting from local Nearly Zero-Energy Buildings (NZEB); and
- Having reached at least EPC A level.

Investment and expenditure in building retrofits that lead to an increase in the energy efficiency of buildings of at least 30%.

### Analytical considerations

- The acquisition, development, construction, and refurbishment of green building projects can support climate change mitigation, and have other benefits, such as increasing the efficiency of energy and water consumption.
- The issuer has confirmed that the majority of green building projects eligible to be financed under the framework relate to the country's renovation efforts, including expenditure linked to the EU Renovation Wave. Drawing on the EU Taxonomy's threshold

put forward in the technical screening criteria for a substantial contribution to climate change mitigation, we consider the 30% minimum improvement requirement for building efficiency to be robust and assign a medium green shade to the activity. In addition, the issuer intends to finance the construction of NZEB+ housing for young people and health education professionals. These buildings will need to have primary energy demand of at least 20% lower than the local NZEB requirements, and thus surpass the threshold for new buildings cited in the EU Taxonomy's technical screening criteria for a substantial contribution to climate change mitigation. However, as we understand that the focus for these buildings is on energy efficiency and operational emissions, and there are no specific requirements or thresholds regarding the buildings' embodied emissions, we allocate a light green shading to this particular activity.

- The issuer has confirmed that eligible buildings will not have direct access to fossil fuel heating. Moreover, all appliances financed under the framework will be entirely electric.
- For all buildings, mitigating the exposure to physical climate risks is crucial to improving climate resilience. In addition, Romania is one of the EU countries most exposed to seismic risk, necessitating a comprehensive risk assessment for any financed assets. As previously mentioned, the issuer conducts a climate risk and vulnerability assessment across assets financed under the framework to better understand the potential impacts of climate change on the asset's performance and durability across the entire life cycle of the investment.
- Certified green buildings often create sustainability benefits. Certifications address several environmental topics and involve a third party for verification. However, this does not necessarily guarantee a low climate impact or highly energy-efficient building, particularly in points-based certification systems. We understand from the issuer that there are currently no projects in the underlying asset registry based on these certificates.

### Environmentally Sustainable Management of Living Natural Resources and Land Use

**Assessment**



**Medium to Light green**

**Description**

Investment and expenditure related to the acquisition, maintenance, and sustainable management of natural resources such as land, water, air, minerals, forests, and wild flora and fauna, including:

- Certified forests (Forest Stewardship Council (FSC), Program for the Endorsement of Forest Certification (PEFC), or equivalent);
- Environmentally sustainable forestry, including afforestation or reforestation, and preservation or restoration of natural landscapes;
- Sustainable agriculture practices and climate smart farming;
- Environmentally sustainable fishery and aquaculture, certified by a reputable third-party organization such as the Marine Stewardship Council (MSC), Best Aquaculture practices (BAP; at least 2 star); and Aquaculture Stewardship Council (ASC);
- Biodiversity conservation, protection, and patrol program.

**Analytical considerations**













- Reducing emissions from agriculture, forestry, and other land use (AFOLU) is critical for a 2050 low carbon and climate resilient future, as are land-based carbon removals. Projects can have significant co-benefits for climate adaptation and biodiversity, but must be implemented with care, considering indirect and direct land use change and any adverse effects on biodiversity, water, local communities, and food security. Conversely, conservation of biodiversity, natural ecosystems, and habitats can have substantial co-benefits for climate change mitigation and adaptation due to critical ecosystem services, including carbon sequestration, local climate regulation, soil stabilization, and storm surge protection.
- Sustainable agriculture is a broad term with different interpretations, depending on context. It should minimize emissions, as well as maintain and enhance soil and water quality, while conserving local biodiversity and ecosystems. In the context of Romania's Green Bond Framework, eligible expenditure under this category include various compensatory payments through the country's National Rural Development Program 2014-2020, which is part of the policy of rural development, funded by the European Agricultural Fund for Rural Development (FEADR), as well as Romania's National Strategic Plan 2023-2027. It sets out

objectives, priorities, and measures for the implementation of the European common agricultural policy (CAP). Compensatory payments are granted to activities including limiting the use of chemical fertilizers, promoting organic farming practices, and animal welfare. For animal welfare, specifically, we understand that the payments depend on meeting the requirements from the EAFRD that go beyond the mandatory legislative standards. This includes measures related to providing adequate space, ventilation, feed, and health care for the animals. We understand that this also includes requirements related to topics such as manure management, a significant source of emissions around livestock. Nevertheless, we note more broadly that livestock projects and new or increased grazing land capacity (alongside potential deforestation for animal feeds) can lead to significant emissions and soil quality reduction, especially for beef production, and thus face significant risk of rebound effects.

- Eligible expenditures with respect to forestry projects include investments in Romania's forest fund, compensatory payments to forest owners for meeting certain requirements, and new areas of urban forests. The eligibility criteria for this category include certifications, such as FSC or PEFC. Such certifications can cover many important environmental topics and can verify improved on-site practices. At the same time, certification systems vary significantly in stringency, can contain loopholes and pitfalls, and in many cases cannot adequately address larger systemic issues.
- Sustainable fishing and aquaculture have the potential to produce sources of protein with a lower carbon and environmental footprint than meat. This will be crucial as the global population grows and consumption patterns become more resource-intensive. That said, serious concerns include fishing practices based on overexploitation, use of a fossil fuel-based fleet of vessels, and plastic pollution. Moreover, there is a risk that fish feed may contain deforestation-linked soy and palm oil. Other adverse environmental effects include escapes, effluent and wastewater discharge, antibiotic use, chemicals use, overexploitation of wild fish stocks and other marine ingredients for feed, and sea lice.
- The issuer informs us that, although it is currently pending interministerial approval, eligible aquaculture expenditure would constitute annual compensatory payments to beneficiaries who have incurred additional costs and/or lost income due to complying with conservation measures or the restrictions of the aquaculture management plan. Through the criteria cited in the framework, projects that are not certified under the ASC, MSC standards, and BAP will be ineligible to receive such measures. With respect to the risks surrounding aquaculture mentioned earlier, we note that the three standards safeguard against some these risks, to varying extents. For instance, ASC has stricter safeguards against deforestation in feed than BAP. ASC's salmon farm standard requires 100% of soy inputs to be certified under the Round Table for Responsible Soy (RTRS) standard; BAP only requires certification of 50% of soy inputs.



S&P Global Ratings' Shades of Green

| Assessments  |   |   |  |   |  |
|--|---|---|--|---|--|
|  Dark green         |  Medium green  |  Light green   |  Yellow   |  Orange  |  Red  |
| <b>Description</b>   |   |   |  |   |  |
| Activities that correspond to the long-term vision of an LCCR future.                                | Activities that represent significant steps toward an LCCR future but will require further improvements to be long-term LCCR solutions. | Activities representing transition steps in the near-term that avoid emissions lock-in but do not represent long-term LCCR solutions. | Activities that do not have a material impact on the transition to an LCCR future, or, Activities that have some potential inconsistency with the transition to an LCCR future, albeit tempered by existing transition measures. | Activities that are not currently consistent with the transition to an LCCR future. These include activities with moderate potential for emissions lock-in and risk of stranded assets. | Activities that are inconsistent with, and likely to impede, the transition required to achieve the long-term LCCR future. These activities have the highest emissions intensity, with the most potential for emissions lock-in and risk of stranded assets. |
| <b>Example projects</b>  |   |   |  |   |  |
|  Solar power plants |  Energy efficient buildings                            |  Hybrid road vehicles                                |  Health care services   |  Conventional steel production   |  New oil exploration  |

Note: For us to consider use of proceeds aligned with ICMA Principles for a green project, we require project categories directly funded by the financing to be assigned one of the three green Shades.

LCCR--Low-carbon climate resilient. An LCCR future is a future aligned with the Paris Agreement; where the global average temperature increase is held below 2 degrees Celsius (2 C), with efforts to limit it to 1.5 C, above pre-industrial levels, while building resilience to the adverse impact of climate change and achieving sustainable outcomes across both climate and non-climate environmental objectives. Long term and near term--For the purpose of this analysis, we consider the long term to be beyond the middle of the 21st century and the near term to be within the next decade. Emissions lock-in--Where an activity delays or prevents the transition to low-carbon alternatives by perpetuating assets or processes (often fossil fuel use and its corresponding greenhouse gas emissions) that are not aligned with, or cannot adapt to, an LCCR future. Stranded assets--Assets that have suffered from unanticipated or premature write-downs, devaluations, or conversion to liabilities (as defined by the University of Oxford).

# Mapping To The U.N.'s Sustainable Development Goals

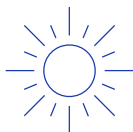
Where the Financing documentation references the Sustainable Development Goals (SDGs), we consider which SDGs it contributes to. We compare the activities funded by the Financing to the International Capital Markets Association (ICMA) SDG mapping and outline the intended linkages within our SPO analysis. Our assessment of SDG mapping does not impact our alignment opinion.

This framework intends to contribute to the following SDGs:

Use of proceeds

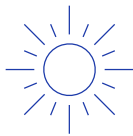
SDGs

Renewable Energy



**7. Affordable and clean energy\***

Energy Efficiency



**7. Affordable and clean energy\***



**9. Industry, innovation and infrastructure\***

Pollution Prevention and Control



**12. Responsible consumption and production\***

Clean Transportation



**11. Sustainable cities and communities\***

Sustainable Water and Wastewater Management



**6. Clean water and sanitation\***



**11. Sustainable cities and communities\***

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Climate Change Adaptation



**13. Climate action\***

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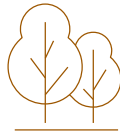
Green Buildings



**11. Sustainable cities and communities\***

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Environmentally Sustainable Management of Living Natural Resources and Land Use



**15. Life on land\***

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\*The eligible project categories link to these SDGs in the ICMA mapping.

## Related Research

- [Analytical Approach: Second Party Opinions: Use of Proceeds](#), July 27, 2023
- [FAQ: Applying Our Integrated Analytical Approach for Use-of-Proceeds Second Party Opinions](#), July 27, 2023
- [Analytical Approach: Shades of Green Assessments](#), July 27, 2023
- [Hydrogen Blending in Gas Pipelines faces Limits due to Leakages: US DOE lab](#), Oct 27, 2023

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## Second Party Opinion: Government of Romania's Green Bond Framework

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