



# GreenRock Energy Austria GmbH Green Bond Second Opinion

24 June 2022

**GreenRock Energy Austria GmbH (“GreenRock Austria”) is an Austrian company established in November 2020 which will construct, acquire, finance and operate solar power plants in Austria and other selected European energy markets.** GreenRock Austria is a wholly owned subsidiary of GreenRock Energy AG and its green bond framework is an update of GreenRock Energy AG’s green bond framework dated 20 December 2020. The two primary changes in the updated green bond framework are: 1) GreenRock Austria as Issuer, and 2) GreenRock Austria plans to issue token-based green bonds, whereby the green bonds are digitally represented as tokens on a blockchain. ‘Proof-of-work’ applications such as the verification of blockchain transactions and the ‘mining’ of certain cryptocurrencies have been shown to involve large amounts of energy consumption. Given each purchase of a token requires verification, and because GreenRock Austria accepts payment in certain cryptocurrencies, the issuances and trading of GreenRock Austria’s green bonds will have associated emissions.<sup>1</sup>

**The green bond framework exclusively focuses on financing of solar PV plants with an installed capacity of up to 750kW for rooftop systems and 5-10 MW for ground-mounted plants.** Renewable energy is crucial for the transition to a low-carbon future. According to the Issuer, no forests would be cleared for the power plants, only brownfield sites would be eligible for ground mounted plants and that, per national regulations, land with high biodiversity value or conservation areas cannot be selected.

**GreenRock Austria is focusing on the generation of renewable energy but could significantly improve governance procedures.** For example, it does not have a sustainability policy nor any specific targets related to environment or climate change. In addition, GreenRock Austria is not screening for whether there is a need to conduct an Environmental Impact Assessments (EIA), e.g. due to location. GreenRock Austria requires its solar modules suppliers to be a part of a recycling program at end of life and informed us that the company requires external environmental experts to conduct site visits ahead of project approval.

Based on the overall assessment of the eligible green assets under this framework and governance and transparency considerations, GreenRock Austria’s green finance framework receives a **CICERO Dark Green** shading and a governance score of **Fair**. The Issuer could improve the framework by strengthening governance procedures, for example it could establish specific climate and environmental targets and policies, screen suppliers for environmental and climate impacts, and screen for the need to conduct an EIA.

<sup>1</sup> CICERO Green’s second opinions are limited to the climatic and environmental aspects of an Issuer’s framework. As such, we have not considered or opined upon any broader aspects relating to GreenRock Austria’s use of blockchain in the issuance of its green bonds. For example, CICERO Green has not investigated or verified, nor provides an opinion on, the regulatory standing or approval (or otherwise) of the Issuer’s green bond process or its anti-money-laundering measures.

## SHADES OF GREEN

Based on our review, we rate GreenRock Austria’s green bond framework **CICERO Dark Green**.

Included in the overall shading is an assessment of the governance structure of the green bond framework. CICERO Shades of Green finds the governance procedures in GreenRock Austria’s framework to be **Fair**.



## GREEN BOND PRINCIPLES

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





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# 1 Terms and methodology

This note provides CICERO Shades of Green's (CICERO Green) second opinion of the client's framework dated July 2022. This second opinion remains relevant to all green bonds and/or loans issued under this framework for the duration of three years from publication of this second opinion, as long as the framework remains unchanged. Any amendments or updates to the framework require a revised second opinion. CICERO Green encourages the client to make this second opinion publicly available. If any part of the second opinion is quoted, the full report must be made available.

The second opinion is based on a review of the framework and documentation of the client's policies and processes, as well as information gathered during meetings, teleconferences and email correspondence.

## Expressing concerns with 'Shades of Green'

CICERO Green second opinions are graded dark green, medium green or light green, reflecting a broad, qualitative review of the climate and environmental risks and ambitions. The shading methodology aims to provide transparency to investors that seek to understand and act upon potential exposure to climate risks and impacts. Investments in all shades of green projects are necessary in order to successfully implement the ambition of the Paris agreement. The shades are intended to communicate the following:

Shading	Examples
 <b>Dark Green</b> is allocated to projects and solutions that correspond to the long-term vision of a low-carbon and climate resilient future.	 Solar power plants
 <b>Medium Green</b> is allocated to projects and solutions that represent significant steps towards the long-term vision but are not quite there yet.	 Energy efficient buildings
 <b>Light Green</b> is allocated to transition activities that do not lock in emissions. These projects reduce emissions or have other environmental benefits in the near term rather than representing low carbon and climate resilient long-term solutions.	 Hybrid road vehicles

Sound governance and transparency processes facilitate delivery of the client's climate and environmental ambitions laid out in the framework. Hence, key governance aspects that can influence the implementation of the green bond are carefully considered and reflected in the overall shading. CICERO Green considers four factors in its review of the client's governance processes: 1) the policies and goals of relevance to the green bond framework; 2) the selection process used to identify and approve eligible projects under the framework, 3) the management of proceeds and 4) the reporting on the projects to investors. Based on these factors, we assign an overall governance grade: Fair, Good or Excellent. Please note this is not a substitute for a full evaluation of the governance of the issuing institution, and does not cover, e.g., corruption.



## 2 Brief description of GreenRock Austria's green bond framework and related policies

GreenRock Energy Austria GmbH (“GreenRock Austria”) is an Austrian company established in November 2020 which will construct, acquire, finance and operate solar power plants in Austria and other selected European energy markets. GreenRock Austria is a wholly owned subsidiary of GreenRock Energy AG and therefore part of the GreenRock Energy group of companies (the “GreenRock Group”). GreenRock Austria's green bond framework is an update of GreenRock Energy AG's green bond framework dated 20 December 2020.<sup>2</sup> The two primary changes in the updated green bond framework are: 1) GreenRock Austria as Issuer, and 2) GreenRock Austria plans to issue token-based green bonds, whereby the green bonds are digitally represented as tokens on a blockchain. Regarding the use of token-based green bonds, see the Background section of this Second Opinion below.

The GreenRock Group is currently mostly active in providing rooftop systems of up to 750 kW - but also provides ground mounted plants of 5-10 MW per plant - and by September 2020, the GreenRock Group had developed, constructed, acquired and/or financed 50 photovoltaic projects mainly in Germany, Italy and Austria. The Issuer informed us it will focus on solar projects of the same type and size as the rest of the GreenRock Group.

### Environmental Strategies and Policies

GreenRock Austria and the GreenRock Group in its entirety operate in the field solar energy, and strive for 100% of their energy consumption to be from renewable sources. According to the Issuer, in planning, constructing, financing and operating its solar energy projects, it works closely with local stakeholders.

GreenRock Austria does not measure or report its Scope 1, 2 and 3 emissions, does not have a dedicated sustainability policy and does not have specific emissions reduction targets. Nor is this currently undertaken or governed at the parent company or group level. However, the Issuer informed us that it has plans to measure and report its Scope 1, 2 and 3 emissions including construction emissions of plants in the future, as well as life cycle emissions from the solar plants. Indeed, according to the Issuer, it is in the process of engaging external consultants to evaluate its construction-related emissions.

The Issuer is aware of higher life cycle emissions from modules it uses which are imported from China and the GreenRock Group is actively engaging with various producers to minimize life cycle impact of modules. The Issuer informed us that the GreenRock Group only buys modules from suppliers who are connected to a recycling system to ensure reuse of old modules (PV cycle).

According to the Issuer, it is aware of physical climate risks and actively assesses potential impacts of risks such as increased risk of flooding or snow loads. It also informed us that every site is assessed by external engineers to ensure that the plants withstand a more extreme weather (currently, e.g., by engineers from Fraunhofer Institute). Neither the Issuer nor the GreenRock group reports in accordance with TCFD recommendations.

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<sup>2</sup> Our Second Opinion on GreenRock Energy AG's green bond framework can be found [here](#).



### Use of proceeds

GreenRock Austria will invest the proceeds in financing and refinancing of solar energy projects. The Issuer plans to implement various photovoltaic projects, falling within the following three categories: 1) solar power plants operating on a feed-in tariff basis, 2) solar power plants operating on the basis of supply contracts, and 3) landlord-to-tenant projects (e.g., rooftop solar power with 100-750kW peak in combination with storage technology and electromobility services to commercial establishments through direct delivery to charging stations via a grid-balanced power purchase).

At least 75% of investments using the funds raised from the financing instruments in the period to 31 October 2030 are to be made in the two core markets of Germany and Italy. According to the Issuer all of the green bond proceeds will go to the financing of new projects.

Projects involving fossil fuel or nuclear power generation cannot be financed or refinanced through the green bond.

### Selection

The selection process is a key governance factor to consider in CICERO Green's assessment. CICERO Green typically looks at how climate and environmental considerations are considered when evaluating whether projects can qualify for green finance funding. The broader the project categories, the more importance CICERO Green places on the governance process.

Projects are selected based on GreenRock Austria's aim of increasing the share of renewable energy. A green bond steering committee has been appointed to guarantee a formal process by ensuring that the projects selected meet all eligibility criteria and are in line with green bond issuance guidelines. The committee consists of the general manager of GreenRock Austria, the head of the legal department at GreenRock Energy AG and the sales manager at GreenRock Austria. While the members of the green bond committee have expertise in the solar industry according to the company, they do not have dedicated environmental and sustainability expertise. According to the Issuer, the committee will convene monthly and decide in consensus. If a project fails to meet all eligibility criteria, the steering committee is in charge of replacing it with a suitable alternative project. Members of the steering committee are tasked with ensuring that all criteria are met throughout the entire life cycle of the solar parks. Typically, projects for selection are either offered by towns/cities that have suitable areas, or they are identified as brownfield surfaces that are not used anymore.

GreenRock Austria informed us it only works with subcontractors who adhere to European standards and that PV module production plants in China are externally certified. Such certifications are reviewed by the Issuer. Projects for financing have already been selected and confirmed as compliant by solar park development experts (GreenRock Austria's employees). European EIA-legislation does not automatically require an EIA for solar projects, but the Issuer has informed us that there is a screening to decide on the appropriate environmental assessment, i.a. depending on location, and that they carry out a risk assessment to identify any environmental, social and economic risks. These risk assessments are typically carried out by the management of the Issuer. Projects will be screened for compliance with the EU Directive on Waste Electrical and Electronic Equipment (WEE, 2012/19/EU).

### Management of proceeds

CICERO Green finds the management of proceeds of GreenRock Austria to be in accordance with the Green Bond Principles.



According to the Issuer, the net proceeds from the green bond will be managed by the financing department on a separate account and will be disbursed individually to the respective projects. The financing department of GreenRock Austria and the green bond steering committee will monitor the allocation of proceeds. Until full allocation is complete, the status will be disclosed in the reports. According to the Issuer, any unallocated proceeds will be held in cash.

GreenRock Austria's bonds may be issued as tokens on a blockchain, which are purchased via its own internet-based platform. GreenRock Austria has confirmed investors will be able to purchase token in both traditional currencies and Bitcoin and Ethereum cryptocurrencies (according to the Issuer, it estimates that under 5% of transactions will be made in cryptocurrency). The Issuer also informed us that proceeds raised will be immediately earmarked and segregated for use in accordance with the framework. Moreover, until there is a need to exchange them into a common currency, there will be a segregation of cryptocurrency payments and payments made in traditional currency.

## Reporting

Transparency, reporting, and verification of impacts are key to enable investors to follow the implementation of green finance programs. Procedures for reporting and disclosure of green finance investments are also vital to build confidence that green finance is contributing towards a sustainable and climate-friendly future, both among investors and in society.

GreenRock Austria will report annually until the green bond financing has been fully repaid on allocation of proceeds and impacts. Additional reports may be published in cases of significant changes such as asset sales. The reporting will be made public as part of the financial statement on the GreenRock website. The person in charge of the green bond project at GreenRock Austria is responsible for the monitoring, recording and reporting of environmentally relevant key data, as well as for the compiling of reports and the management of GreenRock Austria is responsible for the internal reporting procedure.

The allocation reporting will include total amount of proceeds from the green bond, amount of allocated proceeds, portion of total project financing, portion of financing, and information on non-allocated proceeds, if any. The allocation of proceeds will be externally reviewed.

The impact reporting will be provided with quantitative impact indicators including the calculation methodology and will also illustrate any risks and conflicts, the areas affected and how these risks are addressed. Possible conflicts arising for solar parks are:

- Waste from previous properties
- Construction noise/pollution
- Biodiversity
- Environmental sustainability/animal welfare

The impact indicators include:

- Reduction or avoidance of GHG emissions
- Annual output of renewable energy
- Installed capacity of renewable energy projects



According to the framework, GreenRock Austria will report about investments made in cryptocurrencies. The Issuer has also informed us that its reporting will distinguish between proceeds from tokenized and non-tokenized bonds.



### 3 Assessment of GreenRock Austria’s green bond framework and policies

The framework and procedures for GreenRock Austria’s green bond investments are assessed and their strengths and weaknesses are discussed in this section. The strengths of an investment framework with respect to environmental impact are areas where it clearly supports low-carbon projects; weaknesses are typically areas that are unclear or too general. Pitfalls are also raised in this section to note areas where GreenRock Austria should be aware of potential macro-level impacts of investment projects.

#### Overall shading

Based on the project category shadings detailed below, and consideration of environmental ambitions and governance structure reflected in GreenRock Austria’s green bond framework, we rate the framework **CICERO Dark Green**.

#### Eligible projects under the GreenRock Austria’s green bond framework

At the basic level, the selection of eligible project categories is the primary mechanism to ensure that projects deliver environmental benefits. Through selection of project categories with clear environmental benefits, green bonds aim to provide investors with certainty that their investments deliver environmental returns as well as financial returns. The Green Bonds Principles (GBP) state that the “overall environmental profile” of a project should be assessed and that the selection process should be “well defined”.

Category	Eligible project types	Green Shading and some concerns
Renewable Energy	Financing for investment in existing and to-be-developed solar power plants. <ul style="list-style-type: none"> <li>• Projects must be located in Europe.</li> <li>• Only products that are compliant with the EU directive on Waste Electrical and Electronic Equipment (WEE, 2012/19/EU) can be used for the construction of solar power plants.</li> </ul>	<b>Dark Green</b> <ul style="list-style-type: none"> <li>✓ While renewable energy is generally low-carbon, local environmental impacts such as on biodiversity and landscape as well as lifecycle emissions from construction and operation can be of concern, as can new access roads and their unintended environmental impacts. The Issuer informed us that new access roads cannot be financed under the framework.</li> <li>✓ The Issuer informed us that no forest would be cleared for the plants and that plants will be built on brownfield land and on roof surfaces but not on agricultural land.</li> <li>✓ While GreenRock Austria only uses solar modules that are part of a recycling program at end of life, it currently has no</li> </ul>





- dedicated plans for decommissioning and the restoration of land.
- ✓ The Issuer provides direct power purchase agreements mainly to industrial plant operators, farmers and real estate companies but has confirmed that all plants are directly connected to the grid.

Table 1. Eligible project categories

## Background

We understand from GreenRock Austria that it plans to issue token-based green bonds, whereby the green bonds are digitally represented as tokens on the Ethereum blockchain which themselves represent ownership of the bond. The application of blockchain to bonds is most commonly seen in the bond's structuring, issuance, and distribution. Other areas of application include a) ownership transfers, payment, and settlement, and b) benchmarking and reporting.<sup>3</sup> We understand from the Issuer that it will only use blockchain for the bond's structuring, issuance and distribution, though it will also accept Bitcoin and Ethereum payments. Three key benefits are often cited for the use of token-based bonds. Firstly, the immutability of blockchain and end-to-end audit trails of transactions increase transparency and standardization, increasing issuer and investor confidence.<sup>4</sup> Secondly, digitization can lead to lower transaction costs through a reduced need for intermediaries, thereby opening up the market to smaller issuers.<sup>5</sup> Thirdly, tokenization facilitates increased divisibility of the bond, reducing barriers to the market for smaller investors.<sup>6</sup> **CICERO Green's second opinions are limited to the climatic and environmental aspects of an Issuer's framework. As such, we have not considered or opined upon any broader aspects relating to GreenRock Austria's use of blockchain in its green bond.**

There is a substantial need for more renewable energy production, including solar energy. The IEA estimates that, in 2020, renewable energy generation grew by nearly 5%, reaching almost 30% of global electricity supply.<sup>7</sup> Further, the IEA estimates that solar energy was the fastest growing of the renewable sources, with solar capacity growing by around 33% in 2020. Despite these positive trends, further increases in renewable generation are necessary to meet the IEA's Sustainable Development Scenario (SDS) targets: the SDS requires the share of renewables in global electricity supply to reach 50% by 2030 to meet climate and sustainable energy goals.<sup>8</sup> In respect of solar, the SDS requires solar output to increase to 3268 TWh in 2030, up from 720 TWh in 2019.<sup>9</sup>

Solar photovoltaic cells can be energy-intensive to produce. As such, in addition to assessing the metrics for increasing renewable generation capacity and avoided greenhouse gas emissions, CICERO Green places importance on life-cycle assessments and supply chain emissions in providing renewable energy.

The EU has committed itself to a clean energy transition, which will contribute to fulfilling the goals of the Paris Agreement on climate change. As members of the EU, Austria, Germany and Italy – the markets in which the majority of GreenRock Austria's proceeds will be invested – are subject to the EU's climate targets, policies and laws. Via the European Climate Law, the EU has enshrined into EU Law (inter alia), 1) the target of climate

<sup>3</sup> <https://greendigitalfinancealliance.org/wp-content/uploads/2019/12/blockchain-gateway-for-sustainability.pdf>

<sup>4</sup> <https://www.adb.org/sites/default/files/publication/566271/adbi-wp1079.pdf>

<sup>5</sup> <https://www.ledgerinsights.com/dbs-bank-issues-blockchain-bond-as-security-token/>

<sup>6</sup> <https://www.adb.org/sites/default/files/publication/566271/adbi-wp1079.pdf>

<sup>7</sup> <https://www.iea.org/reports/global-energy-review-2020/renewables>

<sup>8</sup> <https://www.iea.org/fuels-and-technologies/renewables>

<sup>9</sup> <https://www.iea.org/data-and-statistics/charts/solar-pv-power-in-the-sustainable-scenario-2000-2030>

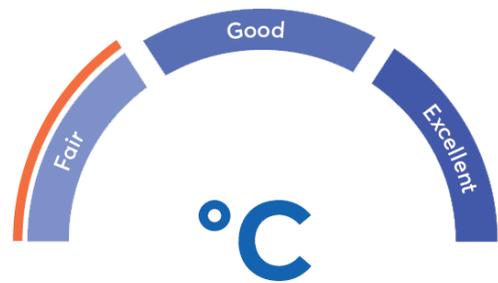


neutrality by 2050, and 2) a net greenhouse gas emission reduction target of 55% by 2030 compared to 1990 levels. In July 2021, the European Commission adopted a set of legislative proposals – ‘Fit for 55’ – that set out how it intends to achieve these climate targets. One element of these proposals is a target of 40% energy consumption from renewable energy sources (the current target is 32%).

### Governance Assessment

Four aspects are studied when assessing the GreenRock Austria’s governance procedures: 1) the policies and goals of relevance to the green bond framework; 2) the selection process used to identify eligible projects under the framework; 3) the management of proceeds; and 4) the reporting on the projects to investors. Based on these aspects, an overall grading is given on governance strength falling into one of three classes: Fair, Good or Excellent. Please note this is not a substitute for a full evaluation of the governance of the issuing institution, and does not cover, e.g., corruption.

GreenRock Austria is focusing on the generation of electricity from solar PV and is by this contributing to the mitigation of climate change. However, GreenRock Austria does not have any specific targets related to environment. The Issuer has not implemented TCFD recommendations but are aware of the climate risk related to their activities. GreenRock Austria currently has no sustainability policy and does not measure or report its emissions. The Issuer is aware of higher life cycle emissions from modules and, according to the Issuer, is planning to measure and report emissions and conduct LCAs.



GreenRock Austria has established a green bond committee that convenes monthly and decides in consensus. While the members of the green bond committee have expertise in the solar industry according to the Issuer, they do not have dedicated environmental and sustainability expertise. GreenRock Austria imports from China and is actively engaging with various producers to minimize life cycle impact of modules. In addition, external experts are inspecting solar PV sites prior to selection.

The Issuer will be reporting on relevant indicators and will obtain an external review of its allocation reporting. Reporting will contain a separate chapter examining the use of cryptocurrencies used in purchasing the bond. Moreover, the Issuer has informed us that its reporting will contain a separate chapter on distinguish between proceeds from tokenized and non-tokenized bonds.

The overall assessment of GreenRock Austria’s governance structure and processes gives it a rating of **Fair**.

### Strengths

It is a clear strength that GreenRock Austria’s framework focuses exclusively on low-carbon solutions. Electricity generated from solar PV plants will increase the share of renewable energy in Austria, Germany and Italy as well as in GreenRock Austria’s other target markets within Europe and is an important contribution to their renewable energy targets.

According to the Issuer, the company is mainly focused on renovation of existing roofs and installing solar modules on these rooftops. In addition, the Issuer builds its PV plants on brownfield land that is not further in use.

The Issuer also informed us that every site is assessed by external engineers (currently, e.g., by engineers from Fraunhofer Institute). A detailed external assessment of every site constitutes a strength.



## Weaknesses

We find no material weaknesses in GreenRock Austria's green bond framework.

## Pitfalls

While renewable energy projects generally are considered to have a very positive climate mitigation impact, there are nevertheless emissions associated with the construction process. While GreenRock Austria currently does not conduct or report life cycle assessments, it is currently planning to do so in the future and is has begun the process of engaging external consultants to measure its construction-related emissions. Life cycle assessments will provide valuable information on the environmental and climate impacts of the projects and point to suppliers that can lead to a reduction in emissions.

The main negative environmental impacts associated with generation of renewable energy include impacts on biodiversity, interference with migration pathways and changes in habitat from construction and operation, and visual pollution of the local environment. This is partly mitigated by the fact that GreenRock Austria focuses on brownfield sites as well as rooftop solar. However, CICERO Green encourages GreenRock Austria to systematically screen to identify the need to carry out an Environmental Impact Assessments (EIA).

There is a risk that projects financed might be exposed to physical climate risks. CICERO Shades of Green encourages the Issuer to systematically assess climate risks and to report in accordance with TCFD. In addition, GreenRock Austria is encouraged to set emission reduction targets for its own operations.

GreenRock Austria is issuing token-based bonds, whereby the green bonds are represented as tokens on the Ethereum blockchain. While the use and incorporation of blockchain technology in bond transactions is growing, it remains an emerging technology. This brings with it regulatory uncertainty, for example the risk of regulatory changes in respect of token-based offerings, especially as more jurisdictions look to adapt securities regulations to token-based assets.<sup>10</sup> According to the framework, GreenRock Austria has satisfied all necessary legal requirements for the bonds. In general, there is a concern that Blockchain technology has the possibility to facilitate money laundering, including through the use of cryptocurrency. GreenRock Austria has informed us it will use a BaFin (the German financial regulator) certified provider to provide know-your-customer services on investors to minimize risks of money laundering. **CICERO Green has not investigated or verified the regulatory standing of the Issuer's green bond process or anti money-laundering measures.**

Certain applications of blockchain have been shown to involve large amounts of energy consumption, most notably 'proof-of-work' applications such as the verification of blockchain transactions and the 'mining' of certain cryptocurrencies. High energy consumption arises because of the need for high-powered computers, each solving complicated algorithms, in 'proof-of-work' applications.<sup>11</sup> Each purchase and/or trade of a GreenRock Austria token on the Ethereum blockchain will require verification. Estimates of the emissions related to the verification of a transaction on the Ethereum blockchain vary, and exact figures depend on the location of the verification and the source of the electricity powering the computers (e.g. coal or renewables). A commonly cited index estimates that each Ethereum transaction emits 72.17 kg CO<sub>2</sub>.<sup>12</sup> GreenRock Austria has informed us that the GreenRock Group produces around 90,000,000 kWh of solar energy per year and that, assuming 3,000 transactions in respect of a green bond, it estimates the use of blockchain in an offering will generate around 130,000 kgCO<sub>2</sub>. Using the

<sup>10</sup> <https://www.oecd.org/finance/blockchain-technologies-as-as-digital-enabler-for-sustainable-infrastructure.htm>

<sup>11</sup> Investors should note that Ethereum plans to move from 'proof-of-work' to 'proof-of-stake' verification, which would lower its related emissions. See e.g.: <https://fortune.com/2021/07/29/ethereum-going-green-ether-crypto-carbon-footprint/>

<sup>12</sup> <https://digiconomist.net/ethereum-energy-consumption/>



German grid emissions factor of 350 gCO<sub>2</sub>e/kWh,<sup>13</sup> an issuer with the same energy production as the GreenRock Group would avoid 31,500,000 kgCO<sub>2</sub> per year.<sup>14</sup> If such an issuer's issuance involves 3,000 blockchain transactions, the emissions associated with these transactions would equate to around 0.4% of its yearly avoided emissions. Investors should also note that non-tokenized bond offerings generate related emissions, for example through the use of computers and data centers in traditional offerings.

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<sup>13</sup> [https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-8/#tab-googlechartid\\_googlechartid\\_chart\\_111\\_filters=%7B%22rowFilters%22%3A%7B%7D%3B%22columnFilters%22%3A%7B%22pre\\_config\\_date%22%3A%5B2019%5D%7D%7D](https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-8/#tab-googlechartid_googlechartid_chart_111_filters=%7B%22rowFilters%22%3A%7B%7D%3B%22columnFilters%22%3A%7B%22pre_config_date%22%3A%5B2019%5D%7D%7D)

<sup>14</sup> This calculation is for illustrative purposes only, for example it does not consider the lifecycle emissions of solar energy production.



# Appendix 1: Referenced Documents List

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Document Number	Document Name	Description
1	GreenRock Austria's Green Bond framework, July 2022	

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## Appendix 2: About CICERO Shades of Green

CICERO Green is a subsidiary of the climate research institute CICERO. CICERO is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen international cooperation. CICERO has garnered attention for its work on the effects of manmade emissions on the climate and has played an active role in the UN's IPCC since 1995. CICERO staff provide quality control and methodological development for CICERO Green.

CICERO Green provides second opinions on institutions' frameworks and guidance for assessing and selecting eligible projects for green bond investments. CICERO Green is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO Green is independent of the entity issuing the bond, its directors, senior management and advisers, and is remunerated in a way that prevents any conflicts of interests arising as a result of the fee structure. CICERO Green operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

We work with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions (ENSO). Led by CICERO Green, ENSO contributes expertise to the second opinions, and is comprised of a network of trusted, independent research institutions and reputable experts on climate change and other environmental issues, including the Basque Center for Climate Change (BC3), the Stockholm Environment Institute, the Institute of Energy, Environment and Economy at Tsinghua University and the International Institute for Sustainable Development (IISD).



- ★ **2021 Largest External Reviewer**, Climate Bonds Initiative Awards
- ★ **2020 External Assessment Provider Of The Year**, Environmental Finance Green Bond Awards
- ★ **2020 Largest External Review Provider In Number Of Deals**, Climate Bonds Initiative Awards
- ★ **2019 External Assessment Provider Of The Year**, Environmental Finance Green Bond Awards
- ★ **2019 Largest Green Bond SPO Provider**, Climate Bonds Initiative Awards
- ★ **2018 External Assessment Provider Of The Year**, Environmental Finance Green Bond Awards
- ★ **2018 Largest External Reviewer**, Climate Bonds Initiative Awards
- ★ **2017 Best External Assessment Provider**, Environmental Finance Green Bond Awards
- ★ **2016 Most Second Opinions**, Climate Bonds Initiative Awards