



Deutsche Pfandbriefbank AG

Green Bond Second Opinion

April 28, 2020

Deutsche Pfandbriefbank AG (“pbb”) is a bank specialized in real estate and public investment finance. pbb has its headquarter in Garching, Germany and has additional offices in the United Kingdom, France, Sweden, Spain and the United States. The issuer is one of the largest issuers in the Pfandbriefe market with an outstanding volume of approx. EUR 30 billion. Around 50% of pbb’s assets are located in Germany.

pbb’s green bond framework lists only green buildings as an eligible project category in accordance to the Green Bond Principles. pbb informed us that approximately 80-85% of proceeds are expected to be allocated to refinancing of existing buildings and 15-20% will be used for financing of new loans for existing buildings mainly in Poland, Germany, France, UK, Netherlands and Austria that either meet a minimum certification of LEED Gold (or equivalent) or absolute minimum energy consumption thresholds defined by pbb’s framework that applies to all jurisdictions of pbb’s business activities. pbb excludes financing of outdated/inefficient heating systems, which excludes, e.g., oil based heating, but could include other fossil fuel heating such as natural gas based heating sources.

The issuer is in the process of rolling out a green loan system and to raise environmentally relevant data for all of its buildings. The issuer informed us that this framework provides a test case for the bank and that the framework is expected to be improved and tightened regarding its eligibility criteria over time. pbb will obtain an external review for its impact reporting.

pbb’s framework does not exclude fossil fuel-based heating and could allow for financing or refinancing that reach minimum certification levels, but do not align with specific energy efficiency thresholds. In addition, pbb does not yet systematically assess climate related risks and has not yet implemented TCFD recommendations. It is the responsibility of the issuer and specifically pbb’s green bond committee to ensure that green buildings exceed local regulations and ensure low-carbon impact and climate resilience of the buildings.

Based on the overall assessment of the project types that will be financed by the green bonds, governance and transparency considerations, pbb’s green bond framework receives a **CICERO Light Green** shading and a governance score of **Good**. The framework would benefit from excluding fossil fuel based heat sources and adding additional requirements for eligible new loans such as low carbon transport access, higher certification levels, climate resilience as well as construction material considerations and construction emissions.

SHADES OF GREEN

Based on our review, we rate the pbb’s green bond framework **CICERO Light 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 pbb’s framework to be **Good**.



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 March 2020. 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:

CICERO Shades of Green



Dark green is allocated to projects and solutions that correspond to the long-term vision of a low carbon and climate resilient future. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Ideally, exposure to transitional and physical climate risk is considered or mitigated.



Medium green is allocated to projects and solutions that represent steps towards the long-term vision, but are not quite there yet. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Physical and transition climate risks might be considered.



Light green is allocated to projects and solutions that are climate friendly but do not represent or contribute to the long-term vision. These represent necessary and potentially significant short-term GHG emission reductions, but need to be managed to avoid extension of equipment lifetime that can lock-in fossil fuel elements. Projects may be exposed to the physical and transitional climate risk without appropriate strategies in place to protect them.



Brown is allocated to projects and solutions that are in opposition to the long-term vision of a low carbon and climate resilient future.

Examples



Wind energy projects with a strong governance structure that integrates environmental concerns



Bridging technologies such as plug-in hybrid buses



Efficiency investments for fossil fuel technologies where clean alternatives are not available



New infrastructure for coal

Sound governance and transparency processes facilitate delivery of the client's climate and environmental ambitions laid out in the framework. Hence, the governance aspects are carefully considered and reflected in the overall shading of the green bond framework. 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.



2 Brief description of pbb's green bond framework and related policies

Deutsche Pfandbriefbank AG (“pbb”) is a bank specialized in real estate and public investment finance. pbb has its headquarter in Garching, Germany and has additional offices in the United Kingdom, France, Sweden, Spain and the United States. The issuer is one of the largest issuers in the Pfandbriefe market with an outstanding volume of approx. EUR 30 billion. Around 50% of pbb's assets are located in Germany.

pbb offers loans for professional real estate investors to finance new and refurbished commercial real estate assets and also provides financing solutions to regional governments, municipalities as well as urban development companies.

Environmental Strategies and Policies

pbb has a group wide sustainability strategy that includes an annual materiality analysis of sustainability aspects and reports in line with the German Sustainability Code. In 2017, pbb established a CSR committee as an instrument for embedding sustainability topics in pbb and to determine sustainability targets. pbb currently has no specific emissions or energy consumption targets for its own operations or the real estate investments. Members of the CSR committee are appointed by the Management Board. pbb considers its own emissions as not material based on its non-financial materiality analysis apart from pbb's own air travel and company car usage. The latter restricts purchase of vehicles with emissions more than 180 gCO₂/km. pbb reports on power consumption of its Germany based premises and consumed a total of 660MWh in 2019, which represents a decrease of 26% compared to 2015 mainly due to IT energy efficiency improvements.

The issuer is currently in the process of developing a “Green Loan Product” for properties with a significant positive impact and are currently collecting ideas and data of new loans. pbb informed us that the issuer aims at implementing these new products in 2021. Currently there is no decision regarding these criteria. In its term sheet and contract, the issuer requires borrowers to report new energy certificates as well as environmental certificates and voluntary additional environmental information.

pbb informed us that the bank routinely assesses public transport access as this influences the long-term ability to sell the property. According to the Verband Deutscher Pfandbriefbanken's “Immobilien- and Marktrating” scaling system, a rating is applied for public transport access incl. parking and charging poles, which is used to assess the overall quality of the location of properties. In addition, the issuer conducts a property analysis that includes inquiring regarding recycled materials. This information is mentioned in the Property Report and are flagged in the “green characteristics” section.

According to the German Pfandbriefgesetz, real estates are regularly to be screened for physical risks, such as flooding. In complex cases, external insurance experts are included in the process. According to the issuer, in complex cases flooding maps are used that incorporate expected climate conditions. pbb intends to test the “Köln. Assekuranz Risiko Lösungen” K.A.R.L. system in 2020, which is dedicated to analyze individual climate risks based on up-to-date climate models. pbb informed us that properties can be financed as long as they are sufficiently insurable against a certain risk event and the property can be used as collateral for Pfandbriefe. A yearly property monitoring is required during the term of the loan for each individual property in order to reflect new developments



(e.g., climate change) or individual events (e.g., floods) in value and eligibility for loans. pbb is currently not using climate scenarios and has not commenced TCFD implementation.

Use of proceeds

An amount equal to the net proceeds will be used to provide financing or refinancing of pbb's eligible green loans, which are financing modernization, refurbishment or acquisition of existing eligible green real estate assets. pbb informed us that approximately 80-85% of proceeds are expected to be allocated to refinancing of existing buildings and 15-20% will be used for financing of new loans for existing buildings. Building projects for the first issuance will mainly be commercial real estate located in Poland, Germany, France, UK, Netherlands and Austria. pbb informed us that only existing buildings are financed in a first step and that refurbishments and developments are financed in a second step.

pbb has exclusion criteria in place regarding the use of buildings for production of weapons, pesticides, nuclear energy, fossil fuels or pornography and sex work. In addition, pbb also excludes financing of outdated/inefficient heating systems. pbb informed us that outdated/inefficient heating includes all oil based heating systems in its portfolio.

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.

pbb will set up a Green Bond Committee that will be in charge of screening eligible green loans against standard credit process incl. CSR commitments and environmental requirements as well as for compliance with the framework's eligibility criteria. The committee will consist of representatives from the business areas Communications, Property Analysis & Valuation, Portfolio Analysis and Treasury. Decisions will be made in consensus.

Management of proceeds

CICERO Green finds the management of proceeds of pbb to be in accordance with the Green Bond Principles. pbb will manage the net proceeds of the Green Bonds on a portfolio basis. The Treasury department will monitor that an amount equivalent to the net proceeds will be used to finance or refinance the portfolio of Eligible Green Loans and that the amount of such Eligible Green Loans within the portfolio is higher than the net proceeds of the outstanding Green Bonds issued. Unallocated proceeds will be invested in Green Bonds fulfilling the ICMA GBP if feasible. If not feasible, unallocated proceeds will be held in cash.

If an Eligible Green Loan no longer meets the eligibility criteria, has matured or redeemed, it will be removed from the portfolio of Eligible Green Loans.

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.



pbb commits to publish both an allocation and an impact report on a portfolio basis annually until full allocation of net proceeds. pbb anticipates to report on the existing portfolio together with the issuance of the first green bond and, subsequently, will report annually in the impact reporting. The allocation reporting includes total amount of outstanding and allocated funds as well as examples of assets financed or refinanced. In addition, pbb will report on relevant impact metrics:

- Green Portfolio breakdown by year of construction / refurbishment (in %)
- Green Portfolio breakdown by EPC kWh / m² p.a. / Certification Type and Level
- Green Portfolio breakdown by year of certification (in %)
- Estimated ex-ante annual energy savings (in kWh/m² p.a.)
- Estimated annual reduced / avoided GHG emissions (in tons of CO₂ equivalent) as per EnEV2009 and the national CO₂ emissions factor.

pbb informed us that the share of individual heating types will also be reported.

The Green Bond Committee will be responsible for the green bonds reporting. CICERO Green will provide an annual review of pbb's green bond reporting.



3 Assessment of pbb’s green bond framework and policies


The framework and procedures for pbb’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 pbb 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 pbb’s green bond framework, we rate the framework **CICERO Light Green**.

Eligible projects under the pbb’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
Green Real Estate	Eligible Green Real Estate Assets have to meet at least one of the following criteria: <ul style="list-style-type: none">  Green Building Certification Eligible Green Real Estate Assets have to be certified against one of the following Green Building Certification with a minimum level such as: <ul style="list-style-type: none"> ○ BREEAM: Very Good or above ○ LEED: Gold or above ○ DGNB: Gold or above ○ HQE: Very High or above Energy Efficiency Performance 	Light Green <ul style="list-style-type: none"> ✓ Loans to buildings with fossil fuel (e.g. natural gas or other) heating/cooling can be included. ✓ Either certified buildings or buildings below an absolute energy consumption threshold applicable to all of pbb’s business regions can be financed. The issuer informed us that the selection committee would prevent to choose a property with a certification but high energy consumption. ✓ BREEAM and LEED covers a broad set of issues that are important to sustainable development. However, these certifications alone do not ensure passive or plus housing. ✓ Certification standards differ considerably in their requirement for energy efficiency and reduction, biodiversity and stakeholder engagement. ✓ There are no mandatory requirements for energy efficiency, climate resilience/physical risks,



Eligible Green Real Estate Assets have to demonstrate a Final Energy Consumption ¹ lower than:	
○ Office, Hotel and Retail ² : < 160 kWh/m ² p.a.	✓
○ Residential: < 100 kWh/m ² p.a.	✓
○ Logistics: < 65 kWh/m ² p.a.	✓

building materials and public transport access. Construction emissions are not considered.

✓ Please consider lock-in effects of domestic fossil fuel consumption for transport and heating/cooling associated with buildings.

✓ For refurbishments, the IEA suggests a necessary improvement of at least 30% improvement.

✓ In a low-carbon 2050 perspective, the energy performance of buildings is expected to be improved, with passive and energy-contributing housing technologies becoming mainstream.

✓ This category receives a light green shading because there are no additional energy efficiency requirements for LEED and BREEAM classifications, no exclusion of fossil based heating systems and energy consumption thresholds that could allow for buildings that do not exceed or only marginally exceed regulations of the respective jurisdictions.

Table 1. Eligible project categories

Background

According to the International Energy Agency (IEA), the buildings and buildings construction sectors combined are responsible for 36% of global final energy consumption in 2018 and nearly 40% of total direct and indirect CO₂ emissions. Appliances (excluding heating, cooking and cooling appliances) are responsible for around 17% of final electricity use by buildings. The energy and emissions savings potential remain largely untapped because of continued use of less efficient technologies, lack of effective policies and weak investments in sustainable buildings. The IEA's Sustainable Development Scenario suggests 50% of new constructed building area in 2030 to be near zero emission – in addition to increased renewable heat sources up to 25% in 2030.³ Energy efficient buildings are crucially important building blocks towards reaching the 2°C goal.

In the EU, buildings are responsible for approximately 40% of EU energy consumption and 36% of the CO₂ emissions.⁴ 75% of heating and cooling in the EU is generated by fossil fuels and the EU commission anticipates

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- Final Energy Consumption is the energy consumption of all building needs including heating, cooling, venting and electricity consumption, expressed in kWh/m² rental / usable area per year
- In case of Real Estate Assets made by several buildings/components, the Final Energy Consumption is determined as an area-weighted average of Final Energy Consumption of each building/component
- In case of Real Estate Assets under construction or modernization, the Final Energy Consumption is determined as the expected Final Energy Consumption after construction/modernization is completed

² Food Retailers Final Energy Consumption lower than 250 kWh/m² p.a. due to the high energy consumption for cooling.

³ <http://www.iea.org/tcep>

⁴ https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en



an urgent need to sharply reduce energy consumption and cut of fossil fuels in order to reach the EU's climate and energy goals.⁵ In addition, electricity production in Europe remains heavily fossil fuel dependent with approximately 21% from coal and lignite and 20% from natural gas and derived gas in 2016.⁶ According to the Climate Action Plan 2050, the German Energiewende (energy transition) is supposed to expand renewable energies in Germany and reduce the energy sector's emissions by 61-62% by 2030 compared to 1990. For the building sector, the government intends to reduce emissions by 66-67% by 2030 compared to 1990. Emissions through burning of fossil fuels from private households have decreased from 129 million metric tonnes in 1990 to 90 million tonnes in 2016 and the average heat consumption for residential buildings amounted to 132 kWh/m² in 2016⁷. The primary heating energy demand limit according to German Energy Efficiency ordinance (EnEV) based calculations⁸ is approximately 50-60kWh/m² for new residential buildings in Germany. In Germany, heating systems are on average 18 years old and in 2016, 26.1% of the installed heating for residential buildings was provided by oil, 49.4% by gas⁹. In terms of number of added heating devices in 2016 in Germany, according to the Bundesverband der Deutschen Heizungsindustrie e.V., 76% were gas based, 10.3% oil based, 3.3% biomass based and 11.5% were heat pumps.¹⁰

In a low carbon 2050 perspective, the energy performance of buildings is expected to be improved, with passive house technology becoming mainstream and the energy performance of existing buildings greatly improved through refurbishments. According to the IEA¹¹, the buildings and buildings construction sectors combined are responsible for 36% of global final energy consumption and nearly 40% of total direct and indirect CO₂ emissions. Efficiency of building envelopes needs to improve by 30% by 2025 to keep pace with increased building size and energy demand – in addition to improvements in lighting and appliances and increased renewable heat sources.¹² Energy efficiency improvements in buildings are thus important building blocks towards reaching the 2°C goal. Also, local transport solutions and easy access to renewable energy are important elements.

Physical climate change such as extreme events and flooding are affecting all sectors and regions already. Due to historical emissions, we are de facto locked in for approximately 1.5°C global warming.¹³ Given today's policy ambition, the world is most likely heading toward 3°C warming in 2100 which implies accelerated physical climate impacts, including more extreme storms, accelerated sea level rise, droughts and flooding.¹⁴ For near-term physical risk, investors and companies must consider the probabilities of physical events and resiliency measures to plan for and protect against the worst impacts.

Governance Assessment

Four aspects are studied when assessing the pbb'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)

⁵ https://ec.europa.eu/energy/topics/energy-efficiency/heating-and-cooling_en

⁶ <https://www.eea.europa.eu/data-and-maps/indicators/overview-of-the-electricity-production-2/assessment-4>

⁷ <https://www.umweltbundesamt.de/daten/private-haushalte-konsum/wohnen/energieverbrauch-privater-haushalte>

⁸ <https://www.verbraucherzentrale.de/wissen/energie/energetische-sanierung/energieeinsparverordnung-enev-13886>

⁹ <https://de.statista.com/statistik/daten/studie/162218/umfrage/beheizungsstruktur-des-wohnbestandes-in-deutschland-seit-1975/>

¹⁰ <https://www.baulinks.de/heizung/heizungsmarkt.php>

¹¹ <https://www.iea.org/topics/energyefficiency/buildings/>

¹² <http://www.iea.org/tcep>

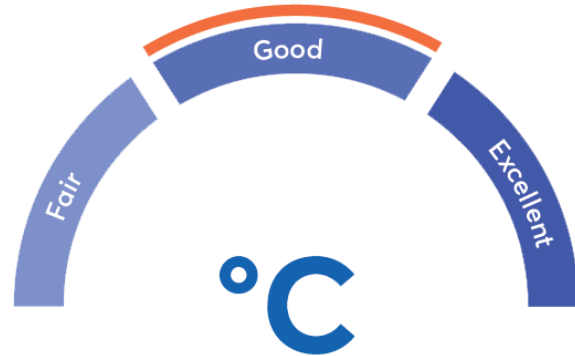
¹³ <https://www.cicero.oslo.no/en/posts/news/scientists-demystify-climate-scenarios-for-investors>

¹⁴ https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full_wcover.pdf



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.

pbb has some sustainability policies in place, but currently does not systematically measure Scope 1,2 or 3 emissions and does not have specific climate related emission reduction targets for its operations or its real estate investments. The issuer will establish a selection committee that decides in consensus and that aims to select buildings with low climate impact. pbb will report on relevant climate indicators in an annual report and will obtain a science-based annual review of its impact reporting. The overall assessment of pbb's governance structure and processes gives it a rating of **Good**.



Strengths

While the criteria are very broadly defined, the issuer aims at selecting properties prudently and informed us that pbb aims at updating its criteria after an initial test phase. As the issuer aims at showcasing low CO₂ emissions/energy consumption in the impact reporting, pbb will likely screen out values with high energy consumption. As an example, pbb excluded two DGNB Gold certified commercial buildings in Germany with an energy consumption value of 360kWh/m²/a and 229kWh/m²/a due to their high climate impact. In addition, the selection committee informed us that it will screen out buildings with high negative environmental impact, such as oil-based heating.

While the company currently has quite broad selection criteria, it reports on relevant climate indicators and aims to report emissions and energy consumption in line with current market practices in Germany. It is a strength that pbb will obtain a science-based external review of its green bond impact reporting.

Weaknesses

Buildings could include new infrastructure for gas or other fossil fuel based heating.

Pitfalls

It is a clear pitfall that pbb currently does not measure its total Scope 1, 2 and/or 3 emissions and that pbb has no specific climate mitigation targets in place.

It is a clear pitfall, that pbb sets one absolute energy consumption threshold that it applies across various markets. While this threshold might be ambitious in some contexts, it might be less ambitious other jurisdictions. CICERO Green has reviewed the current asset pool for the first issuance and found the asset with the highest energy consumption to be a commercial building with a final total energy consumption of approximately 154kWh/m²/a in France tagged as being eligible. This is in contrast to pbb's financing of an office building with the least energy consumption in France which achieves 19.8kWh/m²/a.

CICERO Green takes a long-term view on climate change. pbb use the results of certification assessments as a single eligibility requirement. Green building certifications include many important environmental aspects.



However, certifications such as LEED and BREEAM alone do not necessarily ensure improved energy performance or that resilience and public transport aspects are taken into considerations.

The long-term goal of low carbon societies will eventually require a near phase out of fossil fuels, and marginal climate improvements today should not come in the way of more future oriented solutions that eventually require a near phase out fossil fuels. One should avoid investments in projects that lead down ‘blind alleys’ or lock-in effects that make it more costly to take the next necessary steps towards a low carbon and climate resilient future. For investment in buildings it is important to consider such lock-in effects of, e.g., domestic fossil fuel consumption for transport and heating/cooling.

The green real estate category receives a Light Green shading because of these concerns. To make sure that substantial energy efficiency is achieved, CICERO Green encourages pbb to add binding energy efficiency requirements for certified buildings. In addition, pbb could improve its framework by excluding fossil-based heating systems and, by improving existing buildings by more than 30% as recommended by the IEA, by implementing energy consumption thresholds that drive ambition compared to regulations in the respective jurisdictions as well as by adding binding climate resilience, building material and public transportation criteria.



Appendix 1: Referenced Documents List

Document Number	Document Name	Description
1	Deutsche Pfandbriefbank AG, Green Bond Framework, March, 2020	
2	Annual Report 2018 & 2019	pbb's annual report for 2018 & 2019
3	Nachhaltigkeitskonzept Und Umsetzung	pbb' sustainability and implementation concept
4	Grüne Produkte - Präambel und Info-Pflicht für TS	pbb's contractual language on sustainability und DV
5	Green Testportfolio	Excel file with pbb's preliminary test porfolio



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).

