



# Castellum

## Shades of Green assessment

11 September 2023

 Sector: Real estate  
 Region: Nordics

### Executive Summary

Castellum is a real estate company in the Nordic region. Business operations concern property development, management, acquisition, and sale of commercial premises. At the end of 2022, its property value was approximately 181 billion SEK and total lettable area was 5,696,000 square meters. The company is active throughout Sweden, in Copenhagen and the Helsinki area, and in Norway through its associated company Entra.

### Shading of Castellum's 2022 revenue, operating expenses, and capital expenditures

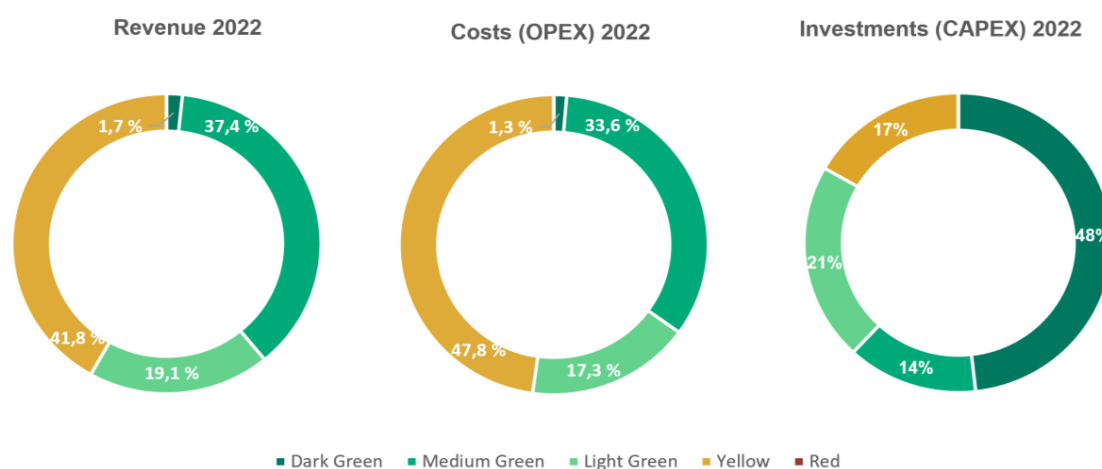


Figure 1: Shading of revenue, operating costs and capital expenditures for Castellum.

In 2022<sup>2</sup>, 58% of rental revenue, 52% of operating costs (opex), and 83% of investments (capex), came from properties with some Shade of Green. The Shade of Green assigned reflects the underlying property's overall climate risk and environmental impact, where we take into account if it is new construction, a major redevelopment or an existing building. From a climate perspective, it is better to renovate existing buildings rather than build new ones, especially in the Nordic context where embodied emissions in building materials typically make up 50% of total lifecycle emissions. Castellum's focus on energy management and climate resilience on a property level mitigates some potential risks regarding transition and physical climate risks and were key considerations for shading both existing and new buildings.

The Shade of Green assigned to Castellum's properties reflects the energy use of the building, the level of environmental certifications and the focus on sustainable materials. Dark Green is allocated to highly energy efficient existing properties with the

### Nasdaq Green Designation Annual Renewal<sup>1</sup>

Based on this review, Shades of Green assesses that Castellum meets the Nasdaq Green Equity Designation requirements for annual renewal as set out in the Nasdaq Green Equity Principles. Castellum has informed us that it intends to apply to the Designation. The awarding of the Green Designation to Castellum is subject to Nasdaq approval.

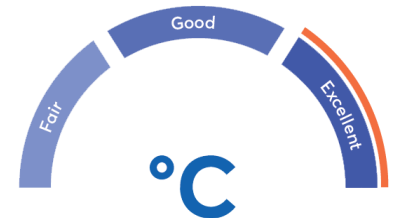
<sup>1</sup> Shades of Green is an approved reviewer to assess alignment with the Nasdaq Green Equity Principles, [Nasdaq.com/Solutions/Nasdaq-Nordic-Green-Designations](https://www.nasdaq.com/Solutions/Nasdaq-Nordic-Green-Designations)

<sup>2</sup> Shades of Green previously conducted a Company Assessment for Castellum in 2022. In response to updated industry guidance on identifying the top 15% of energy-efficient buildings within national building stock, this updated report incorporates revised criteria in its shading methodology.

highest levels of certifications or where reused materials were used in renovations, to support the fact that in a low carbon and climate resilient future, it is needed to reuse more and produce less new. Further, for new construction, it is crucial to reduce embodied emissions from materials compared to the norm, and therefore new properties also need to focus on materials and the climate impact when building. Medium Green is allocated to highly energy efficient properties, and energy efficient properties with either a high level of certification or a focus on reducing embodied emissions. Light Green is allocated to properties that have a high level of environmental certification, but do not qualify to be among the most energy efficient buildings compared to national building stock. For these buildings, the energy performance has been assessed to ensure that no buildings with an EPC label of D or below qualified for Light Green. These buildings were shaded Light Green because of the environmental benefits associated with the certifications achieved by these buildings. Two of the properties that have received a green shading is linked to fossil fuel heating, however there are plans to phase this out. These properties constitute less than 1% of Castellum’s green-shaded portfolio. Properties that do not qualify for any of the criteria for a Shade of Green are allocated a Yellow shade.

### Governance Assessment

**Castellum has a solid sustainability strategy and its business structure facilitates sustainable business decisions.** Castellum’s net-zero target is positive, especially since the target does not include an offset strategy beyond using renewable energy certificates (REC), but is planned to be achieved through activities that directly deliver emissions reductions. It is especially encouraging that all of Castellum’s new developments have started to include re-used/circular materials, where materials that are new must be able to be re-used when demolished. Also, its policies, procedures and reporting follow well-established standards, and climate targets are integrated into decision-making processes. Shades of Green encourages Castellum to continue to develop how it reports on scope 3 emissions, especially embodied emissions from materials. We also encourage Castellum to continue to improve the total energy performance of its portfolio.



**Figure 2: Shades of Green assess Castellum’s governance structure and practice to be Excellent.**

### EU taxonomy

**The relevant EU Taxonomy activities for Castellum are the Construction of new buildings, the Renovation of existing buildings, and the Acquisition and ownership of buildings.** Shades of Green assesses that 43.2% of revenue, 37.6% of OPEX and 12.6% of CAPEX are likely aligned to the acquisition and ownership of buildings category. For the renovation of existing buildings, Castellum does not have a policy that ensures a 30% improvement of Primary Energy Demand (PED), and therefore all renovations are likely not aligned. For the construction of new buildings category, we have assessed that all of the developments that took place in 2022 were likely aligned to the substantial contribution criteria only. Swedish trade associations are currently seeking clarity on the Do-No-Significant-Harm (DNSH) criteria for Transition to circular economy and Pollution prevention and control, therefore further guidance is needed before concluding on alignment. Castellum appears to be aligned to the other DNSH criteria. Shades of Green concludes that Castellum appears to fulfil the requirements of the minimum social safeguards.

**Table 1: Sector specific metrics**

	Energy use (kWh/m <sup>2</sup> )	Environmentally certified (% of area)	Emissions intensity scope 1, 2 and 3 (kg CO <sub>2</sub> e/m <sup>2</sup> )	Heated directly by fossil fuels (% of area)
2022	96	45	24.3	0
2021	91	48	26.8	1
2020	75	39	69.6	1



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# Castellum sustainability governance

## Company description

Castellum is a real estate company in the Nordic region. Its business operations concern property development, management, acquisition, and sale of commercial premises. At the end of 2022, its property value was approximately 181 billion SEK and total lettable area was 5,696,000 square meters. The company is active throughout Sweden, in Copenhagen and the Helsinki area, as well as in Norway through its associated company, Entra. Castellum's asset portfolio has tenants in various industries, where nearly one-quarter of its rental income comes from public companies and government agencies.

## Governance Assessment

Castellum has a business structure that facilitates sustainable business decisions, having solid procedures in place and senior management involved in both the development of the sustainability strategy and its implementation. Climate targets are integrated into decision-making processes. Its strategy to be carbon neutral by 2030 is accompanied by sub-targets for the years to come to make it easier to measure how it is performing on its main target. Castellum's net-zero target is encouraging, especially since the target does not include an offset strategy beyond using RECs, but is planned to be achieved through activities that directly deliver emissions reductions. The methodology to implement these reductions is not yet defined.

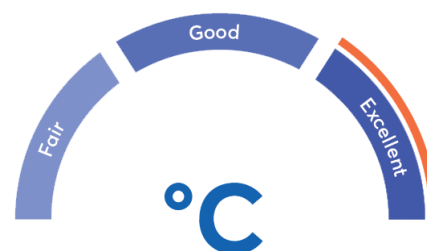
It is especially positive that all Castellum's new developments and renovation and refurbishments have started to include re-used/circular materials, where materials that are new have to be able to be re-used when demolished.

Castellum has set policies based on best practices, for example by having its climate resilience strategy include at the use of future climate scenarios. Castellum's policies, procedures and reporting follow well-established standards, as its targets have been validated by the Science-Based Targets Initiative and it reports according to the Task Force on Climate-related Financial Disclosures (TCFD). The reporting is transparent on the methodologies and assumptions that are used.

The overall assessment of Castellum's governance structure and processes gives it a rating of **Excellent**. To improve, Castellum could continue to develop how it reports on scope 3 emissions, especially linked to embodied emissions from materials.

## Key strategies, policies, and targets

Castellum's ambition is to be the most sustainable property company in Europe. The company states that it will actively promote sustainable development and that sustainability goals should be integrated into business operations and yield tangible results. The long-term goal of Castellum's environmental and climate efforts is to achieve net-zero carbon emissions by 2030 at the latest. Castellum's strategy is to adapt its portfolio to be more energy efficient, take life cycle perspectives into account in investments, assume responsibility for natural resources and biological diversity, increase the share of renewable energy and adapt operations to the consequence of climate change.





In 2017, the board of directors at Castellum adopted a sustainability strategy it has called “The sustainable city 2030”, with 25 measurable targets and actions. The strategy is revised and updated annually, and consists of four areas of focus: the planet, future-proofing, well-being, and social responsibility.

Highlighted objectives are:

- To decrease the direct and indirect carbon emissions in scopes 1,2 and 3 to reach its net zero target by 2030.
- Use natural resources responsibly and efficiently
- Build and manage from a service life perspective, and promote circular models
- Promote increased biological diversity and limit the use and spread of environmentally hazardous products
- Create conditions for responsible waste management through minimising waste, guarding against pollutants, and regarding waste as a resource for use and recycling.

Castellum’s sustainability strategy also entails setting requirements for construction projects. Generally, the following requirements are imposed by the company on contractors: i) follow the code of conduct, ii) follow the sustainability policy, iii) have an environmental management system and waste plan, iv) have an environmental project manager in every project, v) choose energy efficient products, and vi) select sustainable building materials from both an environmental and health perspective, reducing emissions with minimum 15% relative to a reference project.

Castellum’s sustainability initiatives are based on external initiatives such as the GRI Standards, UN Sustainable Development Goals, The Paris Agreement, Sweden’s road map to fossil-free Sweden, UN global compact, OECD guidelines for multinational enterprises, TCFD, ISO 14001, Science Based Targets, sustainability certifications, and local sustainability programs and climate adaption plans. Castellum was named the world’s most sustainable company in the office and industrial sector according to the Global Real Estate Sustainability Benchmark (GRESB).

### *Governance structure*

According to Castellum’s sustainability report, the head of sustainability and the sustainability managers are responsible for oversight of climate-related risks and opportunities, monitoring compliance with the company’s sustainability policy, realising the sustainability strategy, and achieving the sustainability goals. Before investing, the head of sustainability assesses the investment from a sustainability perspective, which includes evaluation of climate risks. Castellum’s board of directors, together with executive management, are responsible for adopting Castellum’s sustainability goals. The CEO is ultimately responsible for all sustainability initiatives. The board of directors and CEO together approve Castellum’s sustainability report on an annual basis. All Castellum employees undergo mandatory web-based training in sustainability, diversity, and codes of conduct, which is also a part of the onboarding of new employees. The sustainability policy and codes of conduct are updated annually.

### *Supply chain*

Castellum has a code of conduct that applies to all procurements and partnerships with suppliers. Its code of conduct references existing international standards such as the UN Global Compact, the UN Guiding Principles on Business and Human Rights, and the OECD Guidelines for Multinational Enterprises. According to its sustainability report, sustainability is an assessment criterion and is weighted into the choice of partners. While there is no formal approach to weighing sustainability factors in decision making processes when evaluating potential new suppliers, Castellum establishes transparent sustainability criteria. The supplier assessment process takes into account the suppliers’ approach and intentions in meeting its sustainability requirements. The company has identified its suppliers, where the vast majority consists of contractors, followed by construction carpentry firms and electricity grid and distribution owners. The company conducts systematic risk analyses of all its partners



to identify high-risk suppliers. To date, no high-risk suppliers have been identified. The company states that this is likely because it has chosen local suppliers with well-developed sustainability initiatives. According to its sustainability report, for every procurement, the supplier must affirm that they work systematically on sustainability. If a supplier violates the code of conduct or sustainability requirements Castellum can cancel the agreement.

#### *Environmental risk management*

Through regular surveys and dialogues with stakeholders, Castellum conducted a materiality analysis in 2021 and identified the sustainability issues that stakeholders consider to be most important. Castellum has identified that its customers, board of directors, suppliers, and employees are central to its operations, and they have therefore been given priority to participate in its materiality analysis. According to the company, additional input was obtained from business intelligence and from discussions with in-house and external experts. The identified issues are i) to minimise climate impact, ii) create more sustainable building materials and installations, and iii) partner with customers for increased sustainability performance.

#### *Social risk awareness*

Castellum is aware of the risk of violations of workers' rights in its supply chain. The code of conduct describes the company's position on human rights, working conditions, and business ethics. According to its sustainability report, Castellum will over the coming years further develop the way it reviews its operations to ensure that no violation of human rights occurs in its value chain. Regarding social risks, it has identified ensuring sustainable supply chains through the evaluation of suppliers regarding environmental impact and social criteria as the main issue.

#### *Reporting*

Castellum reports on its sustainability work according to the Global Reporting Initiative (GRI) through its annual report. The reporting is extensive and includes its long-term goals and commitments, its materiality analysis, and impact reporting. The impact reporting includes its energy consumption, emissions (scopes 1,2, and 3), water use, waste, and the number of sustainability-certified buildings in its portfolio. Reporting is done by property type for most categories. An external consultant conducts a limited assurance of the sustainability reporting. Castellum provides climate reporting in accordance with the TCFD.



## Sector risk exposure



**Physical climate risks.** For the Nordic building sector, the most severe physical impacts will likely be increased flooding, snow loads, and urban overflow, as well as increased storms and extreme weather. Developing projects with climate resilience in mind is critical for this sector. The real estate sector is also exposed to climate risks through links to the construction industry and the utilities sector.

**Transition risks.** Castellum is exposed to transition risks from stricter climate policies e.g., mandatory efficiency upgrades. The company is also exposed to liability risks due to e.g., legal challenges if preventable damages from climate change increase. In addition, the real estate sector is exposed to changing consumer preferences for more climate-smart and energy-efficient buildings.

**Environmental risks.** The construction sector is at risk of polluting the local environment during the erection of the properties, e.g. from poor waste handling. There are also risks related to impacts on local biodiversity/habitats as well as the use of unsustainably sourced material like tropical wood.

**Social risks.** The social risks related to the real estate and construction sector include risks of human rights violations primarily in the supply chain in the sourcing of materials and services. Risks in relation to workers' rights are particularly linked to health and safety for the issuers'/the companies' own employees as well as those of subcontractors.





# Assessment of Castellum's activities

## Key issues and metrics

### *GHG Emissions*

The company targets having net-zero carbon emissions by 2030. This target does not include an offset strategy, beyond using REC, and is planned to be achieved through actual reduction activities. The methodology on how to implement this reduction is not yet defined. The company's carbon emissions come primarily from the manufacture of materials. Currently, embodied emissions from materials are mainly calculated with emission factors and are based on spending data. However, Castellum aims to report more precise data on embodied emissions to get more accurate results.

Total emissions in 2022 (with 2021 in parentheses), measured with the location-based method, was 137,996 tons CO<sub>2</sub>eq (102,914 tons CO<sub>2</sub>eq). The emission numbers are highly affected by Castellum's acquisition of Kungsleden, as the portfolio increased from 554 to 749 properties in 2022. Castellum's emissions intensity in 2022 was 24.3 kgCO<sub>2</sub>eq /m<sup>2</sup> (26.8 kgCO<sub>2</sub>eq/m<sup>2</sup>).

Castellum explains that the decrease in emission intensity within its portfolio is primarily attributable to two key factors: 1) Its development projects have been completed with lower emissions. According to Castellum, this is the result of using specific data, and enforcing stricter emissions standards during the development process. These stricter standards entail using low-emitting materials, adopting low-carbon concrete, reducing the overall quantity of materials used, and incorporating reused materials, among other sustainable practices. 2) purchased goods and services has not kept pace with the growth of the assets in the portfolio, causing each asset to have reduced emissions from purchased goods and services on an intensity level.

The rise in scope 2 emissions from 2021 to 2022 outpaced the increases in scope 1 and 3 emissions. According to Castellum, the disparity can be attributed to the fact that Kungsleden were not actively purchasing green district heating for its assets, resulting in higher scope 2 emissions for these assets compared to those in Castellum's existing portfolio. However, following the acquisition, many of the properties are set to transition into Castellum's purchasing agreements for renewable district heating. As a result, Castellum anticipates a reduction in market-based intensity emissions in scope 2 emissions over the next few years.

Castellum's use of district heating means that its carbon emissions are dependent on the fuel mix used by the district heating facilities. At present, Castellum engages 43 district heating suppliers, which represent 95% of the Group's total Scope 1 and 2 emissions. Castellum is in dialogue with the district heating suppliers with the highest carbon emissions per kWh in order to influence these suppliers to reduce emissions.





**Table 2: GHG emissions (evaluated with the location-based method) and main emission reduction targets**

	Total (tons CO <sub>2</sub> eq)	Scope 1 emissions	Scope 2 emissions	Scope 3 emissions	Specific emissions (emissions intensity) (kgCO <sub>2</sub> eq/m <sup>2</sup> )
<b>Main targets</b>	Carbon neutral by 2030				
<b>2022</b>	137,996	550	31,091	106,355	137,996
<b>2021</b>	102,914	322	16,418	86,174	102,914
<b>2020</b>	308,857	284	18,128	290,175	308,857
<b>Change 2021- 2022</b>	+34%	+41%	+89%	+34%	+41%
<b>Main Sources</b>		Refrigerants, business travel, natural gas, and oil	Electricity and district heating and cooling	Construction, waste, lease assets downstream and ither fuel and energy related emissions in scope 3.	

### Energy

In 2022 (with 2021 figures in parentheses), total energy use was 472 GWh (294 GWh), corresponding to a measured energy intensity of 96 kWh/m<sup>2</sup> (91 kWh/m<sup>2</sup>). Castellum targets a 11% reduction in energy consumption in 2025 compared with 2021, in terms of absolute energy intensity of portfolio. Regarding the portfolio energy intensity, the short-term target is for 70% of the portfolio to have an energy intensity lower than 100kWh/m<sup>2</sup> by 2025 (63% in 2022), and the long-term target is for all properties to have an energy intensity lower than 50kWh/m<sup>2</sup> (28% in 2022). The company also targets to have 100% non-fossil fuel energy by 2030 at the latest. In 2022, it had 95% non-fossil fuel energy. The below table provides information on the energy mix.

**Table 3: Energy mix by source**

Energy source	Percent of total
<b>Electricity (Renewable)</b>	23%
<b>Geothermal</b>	1%
<b>District heating</b>	75%
<b>Fuels</b>	1%

The increase in total energy use in 2022 reflects the acquisition of Kungsleden, which led to an increase in the number of buildings in Castellum’s portfolio. According to Castellum’s annual report, the energy use for the like-for-like portfolio decreased by nine percent in 2022 compared to 2021. According to Castellum, the reduction was achieved by energy efficiency investments and dedicated technical employees working with energy efficiency on a day-by-day basis.



**Table 4: Energy use and main targets**

	Total [MWh]	Intensity [kWh/m2]
<b>Main Targets</b>		<ul style="list-style-type: none"> <li>- By 2025, 70% of the portfolio will have an energy consumption lower than 100kWh/m2</li> <li>- Long-term goal is for the whole portfolio to have an energy consumption lower than 50kWh/m2</li> </ul>
<b>2022</b>	472,129	96
<b>2021</b>	294,111	91
<b>Change 2021-2022</b>	+60%	+5.5%

### Waste handling and circular economy

In 2022, the total waste generated by tenants where there was data available was 5,046 tons. Castellum provides waste management services for some of its properties, however currently does not provide a general waste management service due to the varying waste management setups and waste sorting methods used by different waste contractors in different cities. However, there are ongoing waste reduction initiatives within the organization. These initiatives include measures such as waste weighing, nudging activities, and providing information to tenants.

According to Castellum, it has a plan in place to establish a comprehensive waste management offering with the goal of reducing waste and enhancing waste sorting. This offering is planned to be accessible to all tenants by 2024. It is a part of the company's climate strategy for tenants and supports its science-based target to achieve carbon neutrality by 2030. This decision was reached by the board of directors in mid-2023. The table below provides information on how waste was handled. Construction waste is not included in the table.

For construction projects, contractors must follow certain requirements, for example, having waste management plans in place. Project-specific targets are also set, such as the maximum proportion of waste that can comprise hazardous waste, total waste amounts, minimum levels for sorting and maximum levels sent to be land-filled. Another requirement is that there must be clear guidelines regarding how waste is to be sorted.

In 2021, Castellum set a target that all developments should include re-used/circular materials to some extent. In 2022, the goal of integrating re-use into all projects was implemented. Monitoring on this target will start in 2023. The company also targets that by 2030, re-use and renewable materials will be a significant element in all projects. Castellum has implemented guidelines for all its developments on how to do this. Part of the process is to locate re-used material that can be used in developments. This is followed up quarterly in all its major developments. In 2022, Castellum signed framework agreements with suppliers who are experts in re-use, for the purpose of increasing the company's circular flow of materials and thereby reducing its carbon emissions.

**Table 5: Management of reported waste from tenants**

	Non-hazardous waste sorting rate [%]			Waste [tons]	
	Landfill	Recycling	Incineration	Hazardous waste	Non-Hazardous waste
<b>2022</b>	0.2%	40.6%	59.2%	61	4,985



### *Water consumption*

Castellum targets to reduce water consumption by 1% per year in the like-for-like portfolio. The company has implemented measures including installing low-flow toilets, leak detectors and installation of tap aerators. Smaller scale measures such as collection of rainwater for flushing toilets are also being implemented. For all development projects, Castellum has implemented the EU Taxonomy criteria set out in the DNSH criteria for Sustainable use and protection of water and marine resources.

### *Building certifications*

Castellum aims to have 50% of the asset portfolio (in sqm) environmentally certified by 2025. In 2022, 45% of the asset portfolio had a green building certification. Examples of certifications used are EU Green Building, Miljöbyggnad, BREEAM, LEED and WELL, where BREEAM is the most used. The company strategy is that new office buildings in Sweden must be certified to Miljöbyggnad Gold, whereas new office buildings outside of Sweden are to be certified to the BREEAM Excellent. New logistics buildings are to be certified Miljöbyggnad Silver. Since 2023, LEED O+M was chosen for all new “in-use” certifications. According to Castellum, LEED O+M was chosen as it believes it is the in-use certification that most effectively considers energy, water, and waste performance.

### *Climate Resilience*

In 2022, Castellum had independent experts conduct a climate risk assessment of the entire portfolio at the property level for the purpose of assessing and identifying which properties were exposed to physical climate-related risks. The physical climate risks that are material to the operation were identified using a climate risk and vulnerability analysis. According to Castellum, the latest scientific discoveries and methods were taken into account. The analysis identified the following risks as the most relevant for assessment: 1) Flooding from oceans, 2) Flooding from lakes and watercourses, 3) Flooding from torrential rains, 4) Heat stress, 5) Ground stability (landslides and erosion), 6) Snowfall. The analysis showed that 7 per cent of the property value is exposed to higher risk and will likely be affected in future if no climate adaptation measures are taken for them. A sensitivity analysis shows how the company is impacted financially if 10 per cent of its properties become unusable or unlettable as a result of flooding or water shortages, or that properties that have not been adapted for climate. For those more exposed properties, Castellum has created an action plan: the properties will be analysed more thoroughly by Castellum and it states that relevant investments and initiatives will be implemented to adapt the properties to a changed climate and increase their resilience.

Castellum has implemented specific risk analysis processes for all investments, both for existing properties and new developments. All properties in its portfolio have gone through a portfolio analysis. Castellum has provided us with its risk analysis procedure document, and it is based on:

- A climate analysis provided by The Swedish Meteorological and Hydrological Institute (SMHI), which has used IPCC scenarios to make a country-specific analysis that describes current and future climate, based on a limited emission scenario (RCP4.5) and a high emission scenario (RCP8.5).
- A risk assessment made by The Swedish Civil Contingencies Agency<sup>3</sup>, that has mapped the most vulnerable areas in Sweden regarding rising water levels.

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<sup>3</sup> The Swedish Civil Contingencies Agency is a Swedish state administrative authority that falls under the Ministry of Justice, with responsibility for crisis preparedness, civil defence and protection against accidents, to the extent that no other authority has the responsibility



### Biodiversity

Regarding biodiversity, Castellum has a policy to ensure that there is at least an equal amount of biodiversity upon completion of the projects as there was before a building was constructed. To ensure this the company has created a tool that is adapted to Castellum’s operations with Sweco. Early in the development Castellum analyses all ecosystems on the property. This is measured and scored in the tool with “eco points”. Then a target is set to improve the “eco points” during the development. When the project is completed, a second, follow up analysis is made with the same tool.

**Table 6: Shades of Green assessment of Castellum’s management of key environmental issues**

Key issue	Shades of Green comments
GHG emissions	<ul style="list-style-type: none"> <li>✓ Castellum reports on all three scopes. Today it is still challenging to report on embodied emissions linked to material use, and the current practice is to calculate material-linked emissions with emission factors and base the calculation on spending data. When a better methodology is developed, its ambition is to strengthen its scope 3 emission reporting. In particular, Castellum aims to report more precise data on embodied emissions from different materials used in the future.</li> <li>✓ It is challenging to compare Castellum’s emissions to others in the sector because the methodology on how to measure and calculate emissions is still under development and there is no sector standard yet. However, it is a strength that Castellum is transparent in its reporting, has set quantified targets and is looking at how to strengthen the methodology.</li> <li>✓ Castellum’s net-zero target by 2030 is encouraging, especially since the target does not include an offset strategy beyond using RECs, but is planned to be achieved through activities that directly deliver emissions reductions. Although the methodology on how to implement this reduction is not yet fully defined, the company has three roadmaps to guide it toward the 2030-target. One for management of existing properties, one for tenant energy use, and one for development projects. It is positive that Castellum has set ambitious targets to push innovation and new technology.</li> </ul>
Energy	<ul style="list-style-type: none"> <li>✓ It is positive that Castellum has both short-term and long-term targets linked to energy use, where its long-term target is far below current regulations.</li> <li>✓ The energy intensities in Castellum’s portfolio vary. Therefore, it is positive that Castellum targets to reduce the energy intensity of the like-for-like portfolio.</li> </ul>
Waste handling and circular economy	<ul style="list-style-type: none"> <li>✓ Castellum has procedures regarding waste management and focuses on project-specific targets as well as general targets.</li> <li>✓ Sweden has maintained a low landfilling rate, consistently below 1%, over the past five years. This trend is expected to persist due to the country’s substantial incineration</li> </ul>



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capacity. In fact, Sweden heavily depends on waste incineration, which constituted approximately 53% of municipal waste treatment from 2016 to 2019. Castellum’s sorting rate is in line with national averages.

- ✓ In 2022, 59% of tenant waste was directed towards incineration for district heating purposes. District heating systems that rely on waste incineration often have high emissions, mainly due to the presence of fossil components. Therefore, the implementation of robust waste sorting policies before incineration becomes crucial to minimize the inclusion of fossil elements. While Castellum has policies in place for sorting and offers waste sorting options, the waste sent for incineration still carries the potential for significant emissions.
- ✓ Sweden has set a target that 55% of municipal waste should be prepared for reuse and recycling by 2025, Castellum is currently at 41% for tenant waste.
- ✓ We encourage Castellum to start reporting on waste in construction projects.
- ✓ For the low carbon transition, it is essential that the real estate sector starts to reuse and recycle more. Therefore, Castellum’s reuse and recycling initiative for development projects is encouraging.

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- Water consumption
- ✓ Reducing water consumption also reduces the energy use tied to a property, and it makes water available for other purposes. Even though the Nordics have not had problems with water shortage in general, climate change can lead to unexpected drought periods.
  - ✓ Castellum is looking at new technology to reduce its water usage. One example is that it is looking at collecting rainwater and using it to flush toilets. This saves fresh water, which is normally used in Sweden and the Nordics.

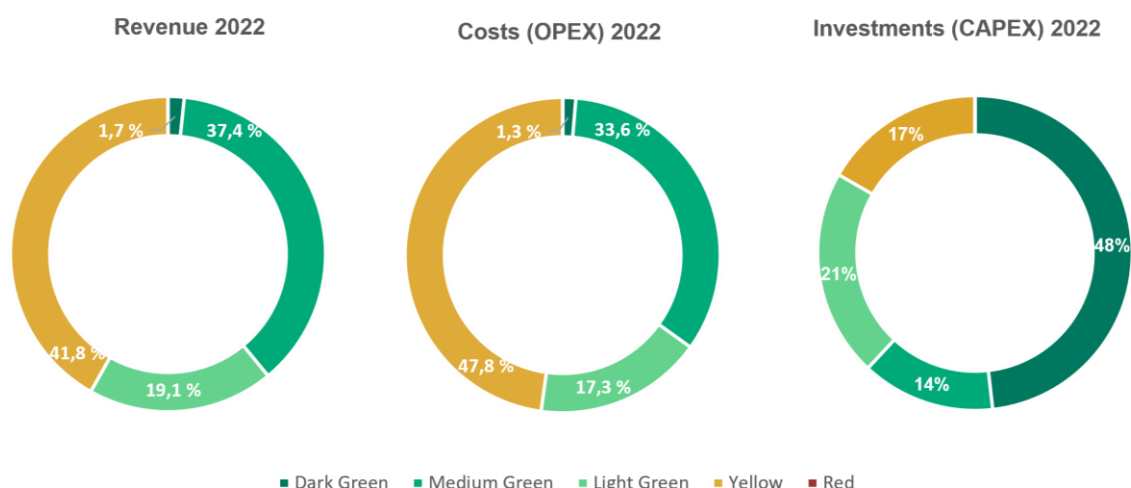
- 
- Sustainability certifications
- ✓ For future developments, Castellum aims to achieve Miljöbyggnad “Guld”, BREEAM “Excellent” or LEED “Gold” for new construction and Miljöbyggnad “Silver”, BREEAM “Very Good”, LEED “Gold for major refurbishments. While certification standards cover a broad set of issues that are important to sustainable development, they differ considerably in their requirements for energy efficiency, embodied emissions of construction materials, transportation emissions, and resiliency.
  - ✓ In general, “in-use” certifications offer fewer environmental considerations than certifications for new developments. While certification schemes like BREEAM In-Use ensure buildings have some environmentally positive qualities, the point-based system do not guarantee a low carbon building and have no requirements on energy efficiency other than energy use monitoring.
  - ✓ However, targeting sustainability certifications shows that the company has environmental development in mind, and used correctly they can be used as tools to lower a building’s carbon footprint and energy use.

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- Climate Resilience
- ✓ Castellum has a solid risk analysis process that captures the most material physical risks it has identified for its operations.
  - ✓ It is a strength that the IPCC scenarios are included in its risk analysis procedure, as it enhances the possibility that its portfolio will be more resilient to future climate change.

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- Biodiversity
- ✓ It is positive that Castellum has a focus on biodiversity and is trying to implement procedures to increase biodiversity in its projects. We have not received any examples from properties where this has been implemented, but Castellum informs us that the tool is
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developed and implemented. It states that it has been successfully applied to several projects.

### Shading of Castellum's revenue, operating expenses and capital expenditures



**Figure 2 Castellum's 2022 revenue, operating costs and investments by Shade of Green**

The Shade of Green assigned to a property reflects its overall climate risk and environmental impact. We have assessed and allocated a shade of green to each property in the portfolio. The assessment has been positively influenced by our assessment of Castellum's Governance Score of Excellent and the company's ambitious sustainability strategy that is quantified and covers multiple important themes such as implementing re-use and recyclable materials in development projects.

Given Castellum's governance and management of key issues, we have assigned a shade to each property, taking into account if it is new construction, a major redevelopment or an existing building. From a climate perspective, it is better to renovate existing buildings rather than build new ones, especially in the Nordic context where embodied emissions in building materials typically make up for 50% of total lifecycle emissions. Therefore, to qualify as green for newer buildings, the requirements for energy efficiency are higher than for existing buildings. For new buildings, we also assess material choices and how embodied emissions linked to the project are considered. Further, Castellum's focus on energy management and climate resilience on a property level mitigates some potential risks regarding transition and physical climate risks, which has influenced the shading for both existing and new buildings.

**Dark Green** is allocated to energy efficient properties with the highest levels of certifications or reused materials in renovations. For new construction, it is crucial to reduce embodied emissions from materials compared to the norm, and therefore new properties also need to focus on materials. Properties that qualify for Dark Green are:

- Existing properties that have an EPC of A and the highest level of certifications such as Miljöbyggnad "Guld" or LEED Platinum, and



- Existing properties with an EPC of A that also has reused materials in renovations.
- Existing properties with an EPC of B, that have onsite renewables, a high level of certifications or has been part of the reused materials initiative can also qualify for a Dark Green shading.
- New properties that can demonstrate an energy performance that is 30% better than regulation. They also have the highest level of certification, solar panels and are using low impact materials.
- There are a few properties that are not 30% better than regulation criteria that still have been allocated a Dark Green shading. These projects have an energy performance that is above 20% better than regulation and have been allocated a Dark Green shading because they are testing innovative technology such as waste-water recovery.
- For renovation projects, we shade the renovation activity itself to be dark green if the PED reduction is above 30%

**Medium Green** is allocated to properties that perform either with its energy performance or through its focus on reducing embodied emissions in the real estate sector. Properties that qualify for a Medium Green shading are:

- Existing properties with a high level of certifications accompanied with an EPC-label of B
- Properties with an EPC-label of A, that doesn't meet any of the other Dark Green criteria.
- Properties with an EPC-label of B or C, that have participated in Castellum's re-use and recycling of materials initiative.
- Existing properties within the top 15% of similar stock.
- New buildings that have an energy performance that is at least 20% better than current regulations, and a high level of certification.

**Light Green** is allocated to transition activities. Properties that qualify for Light Green are:

- Existing properties located in Sweden or Finland with a high level with an EPC-label of B, that does not qualify to be within the top 15% of similar stock.
- Existing properties in Sweden and Finland with a high level of certifications accompanied with an EPC-label of C
- Existing properties that have a design-phase certification with a high level, where there is no EPC-label
- For renovation projects, we shade renovation costs to Light Green if there are PED reductions that are below 30%

**Yellow** is allocated for properties that do not fulfil any of the criteria above.

No assets in Castellum's portfolio have been shaded Red, the shade allocated to projects and solutions that have no role to play in a low-carbon and climate resilient future. These are the heaviest emitting assets, with the most potential for lock in of emissions and is generally not applicable to Nordic real estate.

With these provisions, we find that for 2022 1.7% of rental revenue came from assets considered Dark Green, 37.4% from assets shaded Medium Green, 19.1% from assets shaded Light Green, and 41.8% from non-green assets shaded Yellow. Thus, 58.2% of the rental revenue came from assets with some shade of green.

Operating costs in 2022 were 1.3% Dark Green, 33.6% Medium Green, 17.3% Light Green and 47.8% was shaded Yellow. Thus, 52.2% of operating costs were associated with some shade of green.

Investments in 2022 were 48.2% Dark Green, 13.7% Medium Green, 21.4% Light Green and 16.7% was shaded Yellow.



Investors should note that our assessment is based on data reported or estimated by the company and has not always been verified by a third party. We analyse revenue, operating costs and capital expenditures, however there is typically not an explicit link between sustainability and financial data<sup>4</sup>. Our shading often requires allocating line items in financial statements to projects or products, for this we rely on the company's internal allocation methods. In addition, there are numerous ways to estimate, measure, verify and report e.g. data on emissions, which may make direct comparisons between companies or regulatory criteria difficult and somewhat uncertain.

### *Shading methodology*

Shades of Green previously conducted a Company Assessment for Castellum in 2022. In the methodology used for that report, buildings needed to meet the EU Taxonomy's substantial contribution criteria for climate mitigation to qualify for a Shade of Green. These criteria state that existing buildings must qualify within the top 15% of the similar national building stock in terms of energy efficiency. In 2022, our reference point for making this determination in the Swedish context was a report from Fastighetsägarna. The report assessed that buildings with EPC labels of A, B or C, as well as some buildings with an EPC label of D that met a minimum energy intensity threshold, qualified as within the top 15%.

In December 2022, Fastighetsägarna published an updated report defining the top 15% of the national building stock in Sweden. The updated report tightened the threshold values and made it clear that the EPC label alone was insufficient, and that the building's PED should be used as well to determine whether it falls within the top 15%. Under the updated definition, buildings need to demonstrate better performance on energy efficiency than before in order to qualify within the top 15% and hence be considered aligned with the EU Taxonomy's substantial contribution criteria for climate mitigation.

With the updated definition of the top 15%, it was decided to revise the criteria used to assign a Shade of Green to better reflect the sustainability characteristics of buildings in Castellum's portfolio beyond alignment with the EU Taxonomy. In light of these revised criteria, direct comparisons with the results from last year's report are not possible. If the 2022 Company Assessment methodology had been used to shade the portfolio, between 2021-2022 the overall share of green revenues would have increased from 52% to 55%, the share of green OPEX would have dropped from 60% to 47%, and the share of green CAPEX would have increased from 54% to 73%.

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<sup>4</sup> Most accounting systems do typically not provide a break-down of revenue and investments by environmental impact, and the analysis may therefore include imprecisions and may not be directly comparable with figures in the annual reporting

## EU Taxonomy

The mitigation criteria in the EU taxonomy includes specific thresholds and do no significant harm (DNSH) criteria construction of new buildings, as well as acquisition and ownership of existing buildings<sup>5</sup>. Comments on alignment are given in the table below, and detailed thresholds, NACE-codes and likely alignment with DNSH criteria are given in Appendix 2.

**Table 7: Overall EU Taxonomy alignment**

Overall EU Taxonomy alignment (Substantial contribution + DNSH + minimum safeguards)	Revenue	OPEX	CAPEX
Total share eligible (activities covered by criteria)	100%	100%	100%
Total share likely aligned to all criteria	42.8%	36.9%	12.5%
Total share likely aligned to substantial contribution criteria	42.8%	36.9%	63.6%

### Alignment with minimum social safeguards

To qualify as a sustainable activity under the EU regulation certain minimum social safeguards must be complied with. Shades of Green has assessed the company's social safeguards with a focus on human and labor rights. We take the sectoral, regional and judicial context into account and focus on the risks likely to be the most material social risks. Castellum states that it assesses the actual and potential risks for human rights violations in their own operations, in the operations of their business partners and before they enter into new business relationships. The assessment encompasses the human rights of the following groups: own employees, women, children, indigenous populations, migrant workers, outside contract labour force and local communities. Castellum states that it implements its Code of Conduct for suppliers in their business relationships, and monitor this in their annual risk assessment. Major suppliers are required to sign the Code. Shades of Green concludes that Castellum appears to fulfil the requirements of the minimum social safeguards.

**Table 8: Summary of alignment to 7.1 Construction of new buildings (NACE Code F41.1, F41.2)**

Eligibility	2022 share
Activities covered	0% Revenue, 0% OPEX, 48.2% CAPEX
Substantial contribution	Summary of assessment
Mitigation Criteria	<ul style="list-style-type: none"> <li>✓ Castellum has provided information about 23 new building construction projects. We assess that all of the properties are likely aligned with the mitigation criteria. 48.2% of CAPEX is therefore likely aligned with the substantial contribution criteria</li> <li>✓ Castellum has confirmed that all its developments undergo testing for air-tightness and thermal integrity.</li> <li>✓ For buildings over 5000m<sup>2</sup>, the Global Warming Potential (GWP) of the building will be calculated.</li> </ul>
DNSH-criteria	Summary of assessment

<sup>5</sup> [taxonomy-regulation-delegated-act-2021-2800-annex-1\\_en.pdf \(europa.eu\)](https://eur-lex.europa.eu/eli/reg/2021/2800/annex-1_en.pdf)



<b>Climate Change Adaptation</b>	✓ Likely aligned
<b>Sustainable use and protection of water and marine resources</b>	✓ Likely aligned
<b>Transition to a circular economy (circular economy)</b>	✓ Likely not aligned with 70% threshold for all projects started before end of 2022 ✓ Not possible to conclude on other circularity criteria due to uncertainty about interpretation of taxonomy thresholds
<b>Pollution prevention and control</b>	✓ Not possible to conclude on other circularity criteria due to uncertainty about interpretation of taxonomy thresholds
<b>Protection and restoration of biodiversity and ecosystems</b>	✓ Likely aligned

**Table 9: Summary of alignment to 7.2 Renovation of existing buildings (NACE code F41 and F43)**

<b>Eligibility</b>	<b>2022 share</b>
<b>Activities covered</b>	0% Revenue, 0% OPEX, 13.4% CAPEX
<b>Substantial contribution</b>	<b>Summary of assessment</b>
<b>Mitigation Criteria</b>	✓ Castellum has provided information about 12 renovation projects covered by this activity, where we have assessed that five of the projects are likely aligned to the mitigation criteria 2.8% of CAPEX is therefore likely aligned with the substantial contribution criteria.
<b>DNSH-criteria</b>	<b>Summary of assessment</b>
<b>Climate Change Adaptation</b>	✓ Likely aligned
<b>Sustainable use and protection of water and marine resources</b>	✓ Likely aligned
<b>Transition to a circular economy (circular economy)</b>	✓ Likely not aligned with 70% threshold for all projects started before end of 2022 ✓ Not possible to conclude on other circularity criteria due to uncertainty about interpretation of taxonomy thresholds
<b>Pollution prevention and control</b>	✓ Not possible to conclude on other circularity criteria due to uncertainty about interpretation of taxonomy thresholds

**Table 10: Summary of alignment to 7.7 Acquisition and ownership of buildings (NACE Code L68)**

<b>Eligibility</b>	<b>2022 share</b>
<b>Activities covered</b>	100% Revenue, 100% OPEX, 38.4% CAPEX
<b>Substantial contribution</b>	<b>Summary of assessment</b>



<b>Mitigation Criteria</b>	<ul style="list-style-type: none"> <li>✓ In December 2022, Fastighetsägarna published an updated report defining the top 15% of the national building stock in Sweden. This report was used in the assessment to define the top 15% in Sweden.</li> <li>✓ For buildings built after 31 December 2020, the properties must meet the substantial mitigating criteria set by the activity 7.1 New construction. We find it reasonable to use the current building code (BBR29) as a proxy for Near Zero Energy Buildings (NZEB) in Sweden.</li> <li>✓ We currently have no information about the top 15% in Finland, and could therefore not assess alignment for buildings located in Finland.</li> <li>✓ According to Rådet for Bæredygtigt Byggeri<sup>6</sup>, buildings in Denmark need to have an EPC label of B or A2010 as a minimum. If the property is not covered by the requirement for energy labelling, an energy framework calculation for the building can be used for documentation. Buildings with an EPC of A or B were assessed to be aligned to the mitigation criterion.</li> <li>✓ 43.2% of revenue, 37.6% of OPEX, and 12.6% of CAPEX are likely aligned to the mitigation criteria.</li> <li>✓ Castellum has energy monitoring in place for all buildings, and works with its buildings to improve energy efficiency. Castellum is therefore likely aligned with the criteria stating that buildings should be efficiently operated through energy performance monitoring and assessment.</li> </ul>
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DNSH-criteria	Summary of assessment
<b>Climate Change Adaptation</b>	✓ Likely aligned

### Nasdaq Green Designation

Shades of Green confirms that Castellum meets the requirements for Nasdaq Green Equity Designation set out in the Nasdaq Green Equity Principles.

In 2022, 58% of Castellum’s turnover came from assets with some Shade of Green, exceeding the 50% threshold for green activities for company turnover. The sum of OPEX and CAPEX allocated a Shade of Green is 82%. This exceeds the 50 % threshold for investments, defined as the sum of CAPEX and OPEX. In 2022, Castellum had no turnover assessed shaded Red, meeting the threshold of less than 5% of the company’s turnover being derived from fossil fuel activities.

In addition, this report provides transparency on alignment of the company’s activities with the EU Taxonomy and transparency on the company’s environmental targets and KPIs is provided.

Investors should note that the statements above are the results of Shades of Green’s assessment. The awarding of the Green Designation to Castellum is subject to Nasdaq approval.

<sup>6</sup> The Council for Sustainable Construction is a Danish non-profit membership organization set up to promote sustainability in the construction and real estate industry.











# Terms and methodology

This analysis aims to be a practical tool for investors, lenders, and public authorities for understanding climate risk. Shades of Green encourages the client to make this annual update to the company assessment publicly available. If any part of the annual update or company assessment is quoted, the full report must be made available. Our annual assessment update, including governance, is relevant for the reporting year covered by the analysis. This annual assessment update is based on a review of documentation of the client’s policies and processes, as well as information provided to us by the client during meetings, teleconferences, and email correspondence. In our review, we have relied on the correctness and completeness of the information made available to us by the company.

## Shading corporate revenue and investments

Our view is that the green transformation must be financially sustainable to be lasting at the corporate level. Therefore, we have shaded the company’s current revenue-generating activities, investments, and operating expenses.

The approach is an adaptation of the Shades of Green methodology for the green bond market. The Shade of Green allocated to a green bond framework reflects how aligned the likely implementation of the framework is to a low carbon and climate resilient future, and we have rated investments and revenue streams in this assessment similarly. We allocate a shade of green to the revenue stream and investments according to how these streams reflect alignment of the underlying activities to a low carbon and climate resilient future and taking into account governance issues.

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
 <b>Yellow</b> is allocated to projects and solutions that do not explicitly contribute to the transition to a low carbon and climate resilient future. This category also includes activities with too little information to assess.	 Healthcare services
 <b>Red</b> is allocated to projects and solutions that have no role to play in a low-carbon and climate resilient future. These are the heaviest emitting assets, with the most potential for lock in of emissions and highest risk of stranded assets.	 New oil exploration

In addition to shading from dark green to red, Shades of Green also includes a governance score to show the robustness of the environmental governance structure. When assessing the governance of the company, Shades of Green looks at five elements: 1) strategy, policies, and governance structure; 2) lifecycle considerations



including supply chain policies and environmental considerations towards customers; 3) the integration of climate considerations into their business and the handling of resilience issues; 4) the awareness of social risks and the management of these, and 5) reporting. 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.

The EU Taxonomy, first introduced in 2020, seeks to set out common classification systems to determine the environmental sustainability of activities. The EU-taxonomy regulation<sup>7</sup> defines six environmental objectives. To be considered environmentally sustainable, an activity must substantially contribute to one or more of the six objectives, not significantly harm any of the other six objectives (Do-No-Significant-Harm - DNSH), and comply with the technical screening criteria (TSC). In June 2021, EU published its delegated acts outlining the TSC for climate adaptation and mitigation objectives, respectively, which it was tasked to develop after the Taxonomy Regulation entered into law in July 2020<sup>8</sup>.

Shades of Green has assessed potential alignment against the mitigation thresholds and the DNSH criteria in the delegated acts published in June 2021 in the full assessment of the company carried out in 2021<sup>9</sup>.

In order to qualify as a sustainable activity under the EU regulation 2020/852 certain minimum safeguards must be complied with. The safeguards entail alignment with the OECD Guidelines for Multinational Enterprises and UN Guiding Principles on Business and Human Rights, including the International Labour Organisation's ('ILO') declaration on Fundamental Rights and Principles at Work, the eight ILO core conventions and the International Bill of Human Rights. Shades of Green has completed a light touch assessment of the above social safeguards with a focus on human rights and labor rights risks<sup>10</sup>. We take the sectoral, regional and judicial context into account and focus on the risks likely to be the most material social risk.

Our assessment of alignment against the EU Taxonomy is based on a desk review of the listed source documents against the Taxonomy Delegate Act and following our own shading methodology.

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<sup>7</sup> EU-Taxonomy regulation (2020/852), <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0852&from=EN>

<sup>8</sup> [taxonomy-regulation-delegated-act-2021-2800-annex-1\\_en.pdf](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R2800-01&from=EN) (europa.eu)

<sup>9</sup> [https://www.spglobal.com/\\_assets/documents/ratings/research/sog/green-company-assessment-castellum-23-august-2022.pdf](https://www.spglobal.com/_assets/documents/ratings/research/sog/green-company-assessment-castellum-23-august-2022.pdf)

<sup>10</sup> Shades of Green is in the process of further developing its assessment method to ensure that it encompasses the object and purpose of the minimum safeguards.



## Appendix 1: Referenced documents list

Document Number	Document Name	Description
1	Castellum annual and sustainability report 2022	
2	Castellum annual and sustainability report 2021	
3	Real estate data collection sheet 2022	Data collection sheet filled out by Castellum with data on single properties
4	New_sustainability-goals-2021	Castellum's sustainability goals summarised.
5	Klimatrisker vid investeringsrenden	Example of Castellum's risk procedure
6	Analys av Primarenergital for de 15% basta byggnaderna i Sverige	Fastighetsägarna has made a report to determine the top 15% building stock in Sweden. Fastighetsägarna is a Swedish trade association for real estate companies.





## Appendix 2: EU Taxonomy criteria and alignment

Complete details of the EU taxonomy criteria are given in [taxonomy-regulation-delegated-act-2021-2800-annex-1\\_en.pdf \(europa.eu\)](https://taxonomy-regulation-delegated-act-2021-2800-annex-1_en.pdf)

### 7.1 Construction of new buildings

<b>Framework activity</b>	<b>Green buildings</b>		
<b>Taxonomy activity</b>	<b>7.1 Construction of new buildings (NACE Code F41.1, F41.2)</b>		
	<b>EU Technical mitigation criteria</b>	<b>Comments on alignment</b>	<b>Alignment</b>
Mitigation criteria	<ul style="list-style-type: none"> <li>Substantial contribution to climate change mitigation</li> </ul> <p><b>Constructions of new building, eligible if:</b></p> <ul style="list-style-type: none"> <li>The Primary Energy Demand is at least 10 % lower than the threshold set for the nearly zero-energy building (NZEB) requirements in national regulation. The energy performance is certified using an Energy Performance Certificate (EPC).</li> <li>For buildings larger than 5000 m<sup>2</sup>, upon completion, the building resulting from the construction undergoes testing for air-tightness and thermal integrity, and any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients. As an alternative; where robust and traceable quality control processes are in place during the construction process this is acceptable as an alternative to thermal integrity testing.</li> <li>For buildings larger than 5000 m<sup>2</sup>, the life cycle Global Warming Potential (GWP) of the building resulting from the construction has been calculated for each stage in the life cycle and is disclosed to investors and clients on demand.</li> </ul>	<p><b><u>Contextual information</u></b></p> <ul style="list-style-type: none"> <li>Energy requirements set in BBR (Swedish building regulations) is defined as NZEB in Sweden.</li> <li>In Sweden, climate calculations establishing the GWP for the construction phase are a regulatory requirement since 1 January 2022. The requirement is only valid for properties seeking a construction permit after 1 January 2022. This only covers phase A of construction, while the criterion in the taxonomy refers to phase A-C.</li> </ul> <p><b><u>Information provided by the issuer</u></b></p> <ul style="list-style-type: none"> <li>For upcoming construction projects, Castellum aims to meet the NZEB 10% threshold and will take this into consideration in the planning and construction projects</li> </ul>	<p><b>0% of revenue, 0% of OPEX, and 48.2% of CAPEX eligible</b></p> <p><b>0% of revenue, 0% of OPEX, and 48.2% of CAPEX likely aligned</b></p>

		<ul style="list-style-type: none"> <li>• Castellum has confirmed that all its developments undergo testing for air-tightness and thermal integrity.</li> <li>• For buildings over 5000m2, the Global Warming Potential (GWP) of the building will be calculated.</li> </ul>	
	<b>EU Taxonomy DNSH-criteria</b>	<b>Comments on alignment</b>	<b>Alignment</b>
Climate change adaptation	<p>The physical climate risks that are material to the activity have been identified (chronic and acute, related to temperature, wind, water, and soil) by performing a robust climate risk and vulnerability assessment with the following steps<sup>11</sup>:</p> <ul style="list-style-type: none"> <li>(a) screening of the activity to identify which physical climate risks from the list in Section II of this Appendix may affect the performance of the economic activity during its expected lifetime;</li> <li>(b) where the activity is assessed to be exposed to physical climate risks, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;</li> <li>(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.</li> </ul> <p>The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports, scientific peer-reviewed publications, and open source or paying models.</p> <p>For existing activities and new activities using existing physical assets, the economic operator implements physical and non-physical solutions ('adaptation solutions'), over a period of time of up to five years, that reduce the most important identified physical climate risks that are material to that activity. An adaptation plan for the implementation of those solutions is drawn up accordingly.</p> <p>For new activities and existing activities using newly-built physical assets, the economic operator integrates the adaptation solutions that</p>	<p><b><u>Information provided by the issuer</u></b></p> <ul style="list-style-type: none"> <li>• In 2022, Castellum had independent experts conduct a climate risk assessment of the entire portfolio at the property level for the purpose of assessing and identifying which properties were exposed to physical climate-related risks. The analysis was conducted in accordance with Appendix A and Table II, Classification of climate related hazards. The vulnerability of the properties was assessed based on a changed climate. The physical climate risks that are material to the operation have been identified using a robust climate risk and vulnerability analysis. The latest scientific discoveries and methods were taken into account. The analysis identified the following risks as the most relevant for assessment: <ul style="list-style-type: none"> <li>• Flooding from oceans</li> <li>• Flooding from lakes and watercourses</li> <li>• Flooding from torrential rains</li> <li>• Heat stress</li> <li>• Ground stability (landslides and erosion)</li> <li>• Snowfall</li> </ul> </li> </ul> <p>By assessing the properties according to risk level, the company can determine which of them should be prioritised. The results showed that 7</p>	<b>Likely aligned</b>

<sup>11</sup> The Taxonomy is referring to Appendix A in the Taxonomy Annex 1.



	<p>reduce the most important identified physical climate risks that are material to that activity at the time of design and construction and has implemented them before the start of operations.</p> <p>The adaptation solutions implemented do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities; are consistent with local, sectoral, regional or national adaptation strategies and plans; and consider the use of nature-based solutions or rely on blue or green infrastructure to the extent possible.</p>	<p>per cent of the property value is exposed to high risk.</p> <ul style="list-style-type: none"> <li>For those more exposed properties, there is an action plan: the properties will be analysed more thoroughly and relevant investments and initiatives that will be implemented to adapt the properties to a changed climate and increase their resilience will be defined.</li> </ul>	
<p>Sustainable use and protection of water and marine resources</p>	<p>Where installed, except for installations in residential building units, the specified water use for the following water appliances are attested by product datasheets, a building certification or an existing product label<sup>12</sup> in the Union, in accordance with the technical specifications:</p> <ul style="list-style-type: none"> <li>(a) wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min;</li> <li>(b) showers have a maximum water flow of 8 litres/min;</li> <li>(c) WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres;</li> <li>(d) urinals use a maximum of 2 litres/bowl/hour. Flushing urinals have a maximum full flush volume of 1 litre.</li> </ul> <p>To avoid impact from the construction site, the activity complies with the criteria in the EU Water Framework Directive<sup>13</sup>.</p> <p>Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU<sup>14</sup> and includes an assessment of the impact on water in accordance with the Water Framework Directive, no additional assessment of impact on water is required, provided the risks identified have been addressed.</p>	<p><b><u>Contextual information</u></b></p> <ul style="list-style-type: none"> <li>General planning is the responsibility of the municipality and EIAs will be carried out on municipality level where required by national law. This includes a plan for impacts on water sources.</li> </ul> <p><b><u>Information provided by the issuer</u></b></p> <ul style="list-style-type: none"> <li>Castellum has informed us that the technical specifications for water appliances will be implemented for all its developments moving forward.</li> </ul>	<p><b>Likely aligned</b></p>

<sup>12</sup> The Taxonomy is referring to Appendix E in the Taxonomy Annex 1.

<sup>13</sup> Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

<sup>14</sup> DIRECTIVE 2011/92/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the assessment of the effects of certain public and private projects on the environment.



<p>Transition to a circular economy  (circular economy)</p>	<ul style="list-style-type: none"> <li>At least 70 % (by weight) of the non-hazardous construction and demolition waste (excluding naturally occurring material<sup>15</sup>) generated on the construction site is prepared for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials.</li> <li>Operators limit waste generation in processes related to construction and demolition.</li> <li>Building designs and construction techniques support circularity and in particular demonstrate how they are designed to be more resource efficient, adaptable, flexible and dismantlable to enable reuse and recycling.</li> </ul>	<p><b><u>Contextual information</u></b></p> <ul style="list-style-type: none"> <li>In Sweden, some sorted waste is sent for incineration to district heating facilities. This waste cannot be counted towards the 70%.</li> <li>For the criterion to implement building designs and construction techniques support circularity, Guidance from the EU suggest that one needs to be better than average to comply. As there are not clear metrics on how to demonstrate that one is better than average, it is currently not enough information to judge whether projects fulfil the criterion.</li> </ul> <p><b><u>Information provided by the issuer</u></b></p> <ul style="list-style-type: none"> <li>The company sets requirements for the contractors, for example making it mandatory having waste plans in projects. Specific targets for each individual project are also set.</li> <li>Castellum has adopted demands to fulfil the taxonomy criteria and DNSH for all developments after 2022, and therefore developments started in 2023 will likely be aligned with the 70% threshold.</li> <li>Castellum has a set threshold regarding landfilling of waste. Maximum 5% is sent for landfilling and there can be max 20kg/m2 waste for its developments.</li> <li>It also informed us that it sets demands for new construction materials so that they can be re-used when demolished and also demand the use of re-used materials during the construction phase.</li> </ul>	<p><b>Likely not aligned with 70% threshold for all projects started before end of 2022</b></p> <p><b>Not possible to conclude on other circularity criteria due to uncertainty about interpretation of taxonomy thresholds</b></p>
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<sup>15</sup> Refer to the European List of Waste established by Commission Decision 2000/532/EC

<p>Pollution prevention and control</p>	<ul style="list-style-type: none"> <li>• Building components and materials used in the construction comply with the criteria set out in Appendix C to the Taxonomy Annex 1.</li> <li>• For building components and materials used in the construction that may come into contact with occupiers' formaldehyde emissions are within relevant limits<sup>16</sup>.</li> <li>• Where the new construction is located on a potentially contaminated site (brownfield site), the site has been subject to an investigation for potential contaminants<sup>17</sup>.</li> <li>• Measures are taken to reduce noise, dust and pollutant emissions during construction or maintenance works.</li> </ul>	<p><b><u>Contextual information</u></b></p> <ul style="list-style-type: none"> <li>• Two Swedish sector organizations (Fastighetsägarna and Byggindustrierna) are currently leading the process of getting sector-specific interpretations to Appendix C.</li> <li>• Measures to reduce noise, dust and pollutant emissions during construction and maintenance is regulated by law and the Swedish "miljöbalken"<sup>18</sup>.</li> <li>• All the construction projects need to have a plan for how these issues are addressed in a construction project and is disclosed to and followed up by the municipality before, during and after the construction phase.</li> </ul> <p><b><u>Information provided by the issuer</u></b></p> <ul style="list-style-type: none"> <li>• Castellum use Byggvarubedömningen<sup>19</sup> and only use recommended or accepted products.</li> </ul>	<p><b>Not possible to conclude due to uncertainty about interpretation of taxonomy thresholds</b></p>

<sup>16</sup> Emit less than 0,06 mg of formaldehyde per m<sup>3</sup> of material or component and less than 0,001 mg of categories 1A and 1B carcinogenic volatile organic compounds per m<sup>3</sup> of material or component, upon testing in accordance with CEN/TS 16516522 and ISO 16000-3 523 or other comparable standardised test conditions and determination method.

<sup>17</sup> Standard ISO 18400 can be used.

<sup>18</sup> "Miljöbalken" is the Central Environmental Act in Sweden which came into force in 1999 and consolidates and has strengthened the previous environmental legislation. The overall purpose of the Environmental Code is to promote long-term sustainable development.

<sup>19</sup> Byggvarubedömningen is a non-profit organization owned by large constructors and property owners in Sweden. The organization has formulated evaluation standards for appraising construction products and has established a database. Assessments encompass factors such as chemical composition, product lifecycle, and social responsibility at the supplier level. The results of these evaluations are subsequently categorized into three levels: Recommended (green), Accepted (yellow), and Avoid (red), and are accessible in the assessment database.



<p>Protection and restoration of biodiversity and ecosystems</p>	<ul style="list-style-type: none"> <li>• An Environmental Impact Assessment (EIA) or screening should be completed in accordance with national provisions<sup>20</sup>.</li> <li>• Where an EIA has been carried out, the required mitigation and compensation measures for protecting the environment are implemented.</li> <li>• For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment where applicable, has been conducted and based on its conclusions the necessary mitigation measures are implemented.</li> <li>• The new construction should not be built on one of the following:             <ol style="list-style-type: none"> <li>a) arable land and crop land;</li> <li>b) greenfield land of recognised high biodiversity value and land that serves as habitat of endangered species (flora and fauna) listed on the European Red List or the IUCN Red List.</li> <li>c) land matching the definition of forest as set out in national law used in the national greenhouse gas inventory, or where not available, is in accordance with the FAO definition of forest<sup>21</sup>.</li> </ol> </li> </ul>	<p><b><u>Contextual information</u></b></p> <ul style="list-style-type: none"> <li>• In Sweden, general planning is the responsibility of the municipality and EIAs will be carried out on municipality level. Before construction on new land is permitted, the builder needs to prepare a detailed plan and receive a building permit. Land that is covered by area protection according to the Planning and Building Acts includes Natura 2000, nature reserves and animal and plant protection areas, and construction is not permitted. This is stated in the general and detailed plan for each municipality. The company has confirmed that no new construction is built on the areas listed in (a), (b), and (c) of this DNSH criteria, which is considered to be covered by the building permit.<sup>22</sup></li> </ul>	<p><b>Likely aligned</b></p>
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<sup>20</sup> The Taxonomy is referring to Appendix D in the Taxonomy Annex 1.

<sup>21</sup> Land spanning more than 0,5 hectares with trees higher than five meters and a canopy cover of more than 10 %, or trees able to reach those thresholds in situ. It does not include land that is predominantly under agricultural or urban land use, FAO Global Resources Assessment 2020. Terms and definitions: <http://www.fao.org/3/I8661EN/i8661en.pdf>.

<sup>22</sup>[https://www.fastighetsagarna.se/globalassets/bilder/fakta/taxonomi/dokument/fa-bf-taxonomi-tolkning-av-aktivitet-71-72-och-77-rev-230605\\_1-1.pdf?bustCache=1694014259346](https://www.fastighetsagarna.se/globalassets/bilder/fakta/taxonomi/dokument/fa-bf-taxonomi-tolkning-av-aktivitet-71-72-och-77-rev-230605_1-1.pdf?bustCache=1694014259346)



## 7.2 Renovation of existing buildings

Framework activity	Green buildings		
Taxonomy activity	7.2 Renovation of existing buildings (NACE code F41 and F43)		
	<b>EU Technical mitigation criteria</b>	<b>Comments on alignment</b>	<b>Alignment</b>
Mitigation criteria	<ul style="list-style-type: none"> <li>Substantial contribution to climate change mitigation</li> </ul> <p><b>Renovation of existing buildings, eligible if:</b></p> <ul style="list-style-type: none"> <li>The reduction of primary energy demand (PED) must be at least 30%.</li> </ul>	Castellum has not confirmed that it expects a 30% reduction of PED for its renovation projects.	<p><b>0% of revenue, 0% of OPEX, and 13.4% of CAPEX eligible</b></p> <p><b>0% of revenue, 0% of OPEX, and 2.8% of CAPEX likely aligned</b></p>
	<b>EU Taxonomy DNSH-criteria</b>		<b>Alignment</b>
Climate change adaptation	<ul style="list-style-type: none"> <li>Please refer to Construction of new buildings.</li> </ul>	Please refer to Construction of new buildings.	
Sustainable use and protection of water	<ul style="list-style-type: none"> <li>Where installed, except for installations in residential building units, the specified water use for the following water appliances are attested by product datasheets, a building certification or an existing product label<sup>23</sup> in the Union, in accordance with the technical specifications:</li> </ul>	Please refer to Construction of new buildings.	

<sup>23</sup> The Taxonomy is referring to Appendix E in the Taxonomy Annex 1.





and marine resources	<ul style="list-style-type: none"> <li>(e) wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min;</li> <li>(f) showers have a maximum water flow of 8 litres/min;</li> <li>(g) WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres;</li> <li>(h) urinals use a maximum of 2 litres/bowl/hour. Flushing urinals have a maximum full flush volume of 1 litre.</li> </ul>		
Transition to a circular economy  (circular economy)	Please refer to Construction of new buildings.	Please refer to Construction of new buildings.	
Pollution prevention and control	<ul style="list-style-type: none"> <li>• Building components and materials used in the construction comply with the criteria set out in Appendix C to the Taxonomy Annex 1.</li> <li>• Building components and materials used in the construction that may come into contact with occupiers emit less than 0,06 mg of formaldehyde per m<sup>3</sup> of material or component and less than 0,001 mg of carcinogenic volatiles<sup>24</sup>.</li> <li>• Measures are taken to reduce noise, dust and pollutant emissions during construction or maintenance works.</li> </ul>	Please refer to Construction of new buildings.	

### 7.7 Acquisition and ownership of buildings

<b>Framework activity</b>	<b>Green buildings</b>
<b>Taxonomy activity</b>	<b>7.7 Acquisition and ownership of buildings (NACE Code L68)</b>

<sup>24</sup> Categories 1A and 1B carcinogenic volatile organic compounds per m<sup>3</sup> of material or component, upon testing in accordance with CEN/TS 16516522 and ISO 16000-3 523 or other comparable standardised test conditions and determination method.



	EU Technical mitigation criteria	Comments on alignment	Alignment
Mitigation criteria	<ul style="list-style-type: none"> <li>Substantial contribution to climate change mitigation</li> </ul> <p><b>Acquisition and ownership of buildings, eligible if:</b></p> <ul style="list-style-type: none"> <li>For buildings built before 31 December 2020, the building has at least Energy Performance Certificate (EPC) class A. As an alternative, the building is within the top 15% of the national or regional building stock expressed as operational Primary Energy Demand (PED) and demonstrated by adequate evidence, which at least compares the performance of the relevant asset to the performance of the national or regional stock built before 31 December 2020 and at least distinguishes between residential and non-residential buildings.</li> <li>For buildings built after 31 December 2020, the building meets the criteria set out for the activity ‘construction of new buildings’.</li> <li>Where the building is a large non-residential building it is efficiently operated through energy performance monitoring and assessment.</li> </ul> <p>For buildings built after 31 December 2020, buildings are eligible if:</p> <ul style="list-style-type: none"> <li>The Primary Energy Demand is at least 10 % lower than the threshold set for the nearly zero-energy building (NZEB) requirements in national regulation. The energy performance is certified using an Energy Performance Certificate (EPC).</li> </ul>	<ul style="list-style-type: none"> <li>Since the last assessment, Fastighetsägarna <sup>25</sup> has published an updated report defining the energy efficiency of the top 15% of the national building stock. We consider the updated report to provide adequate evidence for the energy efficiency of the top 15% of the national building stock.</li> <li>For buildings built after 31 December 2020, where the properties must meet the substantial mitigating criteria set by the activity 7.1 new construction. We find it reasonable to use the current building code (BBR29) as a proxy for Near Zero Energy Buildings (NZEB) in Sweden.</li> <li>According to Rådet for Bæredygtigt Byggeri <sup>26</sup>, buildings need to have an EPC label of A2010 as a minimum. If the property is not covered by the requirement for energy labelling, an energy framework calculation for the building can be used for documentation.</li> <li>There is currently no public information defining the energy efficiency of the top 15% of the Finnish building stock, therefore there is currently not enough information to assess buildings located in Finland.</li> <li>Castellum has energy monitoring in place for all buildings, and work with its buildings to improve energy efficiency. Castellum is therefore likely aligned with the criteria stating that buildings should be efficiently operated through energy performance monitoring and assessment.</li> </ul>	<p><b>100% of revenue, 100% of OPEX, and 38.4% of CAPEX eligible</b></p> <p><b>43.2% of revenue, 37.6% of OPEX, and 12.6% of CAPEX likely aligned</b></p>

<sup>25</sup> [Topp 15 och 30% \(fastighetsagarna.se\)](https://www.fastighetsagarna.se)

<sup>26</sup> [Green Building Council Denmark: Taksonomivejledning v. 2.0 for 7.7 Erhvervelse og ejerskab af eksisterende ejendom.pdf \(bubble.io\)](https://www.greenbuildingcouncil.dk/Taksonomivejledning_v.2.0_for_7.7_Erhvervelse_og_ejerskab_af_eksisterende_ejendom.pdf)



	<b>EU Taxonomy DNSH-criteria</b>	<b>Comments on alignment</b>	<b>Alignment</b>
Climate change adaptation	Please refer to Construction of new buildings.	Please refer to Construction of new buildings.	



**Shades of Green** now a part of **S&P Global**  
Formerly part of CICERO

## Appendix 3: About Shades of Green

Shades of Green, now a part of S&P Global and formerly part of CICERO, provides independent, research-based second party opinions (SPOs) of green financing frameworks as well as climate risk and impact reporting reviews of companies. At the heart of all our SPOs is the multi-award-winning Shades of Green methodology, which assigns shadings to investments and activities to reflect the extent to which they contribute to the transition to a low carbon and climate resilient future.

Shades of Green Company Assessments indicate the greenness of a company by providing a shading of revenues, operating costs and capital expenditures, as well as an assessment the company’s governance structure. Shades of Green also provides second opinions on institutions’ frameworks and guidance for assessing and selecting eligible projects for green, sustainability and sustainability-linked bond investments. Shades of Green is internationally recognized as a leading provider of independent reviews of green bonds, since the market’s inception in 2008. Shades of Green is independent of the company being assessed, 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. Shades of Green operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of assessments



- ★ **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