

ASSESSMENT

23 August 2024



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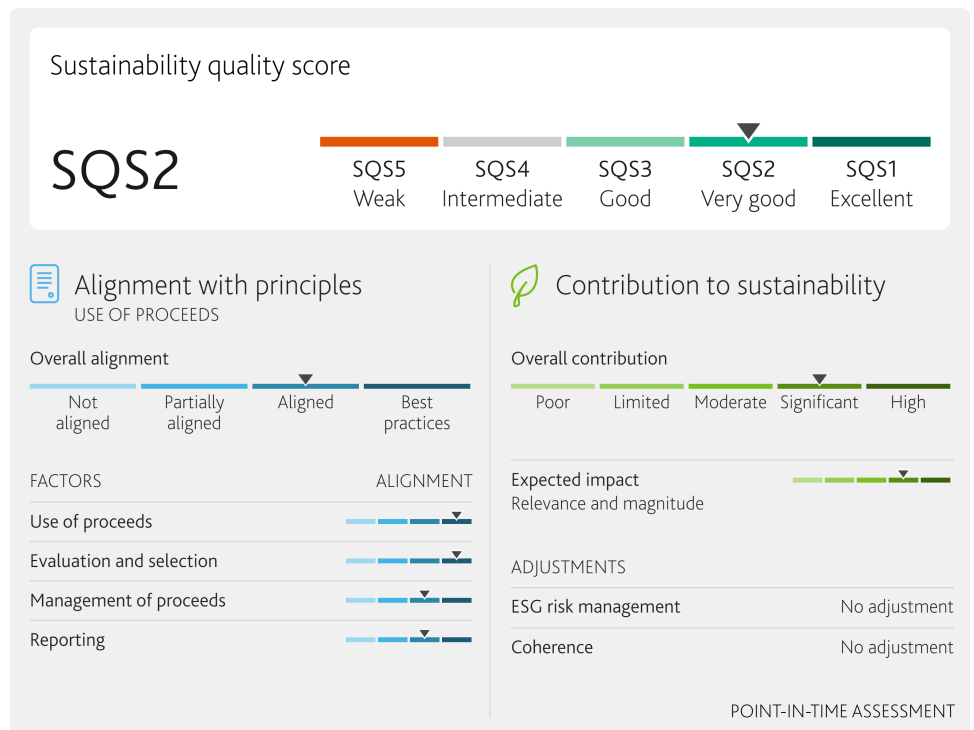
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Knorr-Bremse AG

Second Party Opinion – Green Finance Framework Assigned SQS2 Sustainability Quality Score

Summary

We have assigned an SQS2 Sustainability Quality Score (very good) to Knorr-Bremse's green finance framework, dated August 2024. Knorr-Bremse has established its framework with the aim of financing projects across four eligible green categories: clean transportation, renewable energy, energy efficiency and green buildings. The framework is aligned with the four core components of the International Capital Market Association's (ICMA) Green Bond Principles (GBP) 2021 (with June 2022 Appendix 1), and the Loan Market Association, Asia Pacific Loan Market Association and Loan Syndications & Trading Association's (LMA/APLMA/LSTA) Green Loan Principles (GLP) 2023. The framework also demonstrates a significant contribution to sustainability.



Scope

We have provided a Second Party Opinion (SPO) on the sustainability credentials of Knorr-Bremse's green finance framework, including the framework's alignment with the ICMA's GBP 2021 (with June 2022 Appendix 1) and the LMA/APLMA/LSTA's GLP 2023. Under its framework, the issuer plans to issue green financing instruments to finance projects under four green eligible categories — clean transportation, renewable energy, energy efficiency and green buildings (as outlined in Appendix 2 of this report).

Our assessment is based on the last updated version of the framework received on 21 August 2024, and our opinion reflects our point-in-time assessment¹ of the details contained in this version of the framework, as well as other public and non-public information provided by the company.

We produced this SPO based on our [Framework to Provide Second Party Opinions on Sustainable Debt](#), published in October 2022.

Issuer profile

Headquartered in Munich, Germany, capital goods producer Knorr-Bremse AG (Knorr-Bremse) is the world's leading supplier of brake systems to the truck and railway industries, which account for most of the group's revenue. Other lines of business include door systems and air-conditioning systems for rail vehicles, and powertrain systems for commercial vehicles. The group employed about 33,000 people in 2023.

Knorr-Bremse is moderately exposed to environmental risks, driven by physical climate risks, waste and pollution, and use of natural capital. The company's exposure to carbon transition is low, because brake systems are agnostic to the propulsion systems of trucks, and railway systems could even be winners of carbon transition trends. As part of its Climate Strategy 2030, the issuer has committed to reducing its scope 1 and 2 emissions by 75% by 2030 compared with the level in 2018, and to diminishing its scope 3 emissions by 25% by 2030 compared with the level in 2021. To reduce its scope 1 and 2 emissions, Knorr-Bremse primarily relies on improving energy efficiency, fuel switch activities and the development of on-site renewable energy. Knorr-Bremse also contributes to global decarbonization by providing products for low-carbon transportation. Its green finance framework is projected to further enhance these strategic endeavors.

Strengths

- » The eligibility criteria for the financed projects follow the substantial contribution criteria for selected economic activities, as laid out in the EU Taxonomy Climate Delegated Act for Climate Change Mitigation.
- » The environmental objective is clearly defined and relevant for all eligible categories.
- » Comprehensive and transparent project evaluation and selection processes are in place and include relevant expertise.

Challenges

- » The allocation period for proceeds exceeds the market's best practice of 24 months.
- » There is no commitment to undertake an independent review of the impact reporting.
- » Although the projects in the energy efficiency category are highly relevant to the issuer's operations, not all equipment will consistently adhere to the most stringent technological standards available in the market.

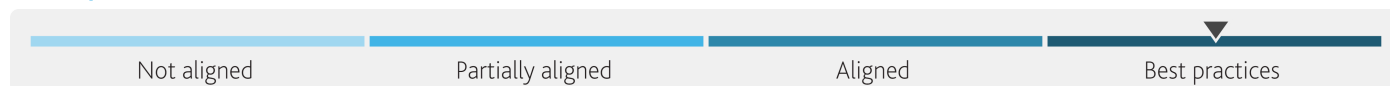
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Alignment with principles

Knorr-Bremse's green finance framework is aligned with the four core components of the ICMA's GBP 2021 (with June 2022 Appendix 1) and the LMA/APLMA/LSTA's GLP 2023:

- Green Bond Principles (GBP)
- Social Bond Principles (SBP)
- Green Loan Principles (GLP)
- Social Loan Principles (SLP)
- Sustainability-Linked Bond Principles (SLBP)
- Sustainability Linked Loan Principles (SLLP)

Use of proceeds



Clarity of the eligible categories – BEST PRACTICES

Knorr-Bremse has clearly communicated the nature of expenditures, which will be capital spending and operational expenditure. Furthermore, the company has clearly defined the eligibility criteria for all eligible categories. Although the framework does not contain specific exclusion criteria, its investments are strictly confined to the selected economic activities defined within the EU Taxonomy's scope, inherently excluding any investments outside of this predefined area. The issuer has stated that many of the eligible projects will take place in countries in which Knorr-Bremse currently operates. In addition, end products incorporating components from Knorr-Bremse are distributed globally. The company has specified that the projects to be financed will comply with the substantial contribution criteria outlined in the EU Taxonomy Climate Delegated Act, thus constituting a reference to stringent, internationally recognized technical thresholds.

Clarity of the environmental or social objectives – BEST PRACTICES

The issuer has defined a relevant environmental objective pertaining to eligible categories that is coherent with international standards, specifically focusing on climate change mitigation. The framework references relevant United Nations' (UN) Sustainable Development Goals (SDGs), and environmental objectives specified in the EU Taxonomy to articulate eligible category objectives.

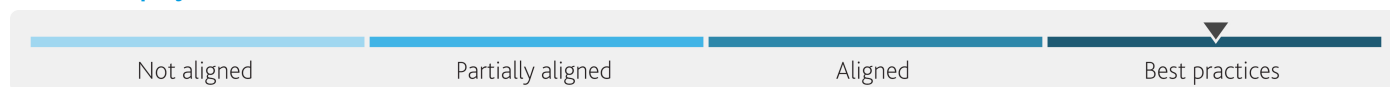
Clarity of the expected benefits – BEST PRACTICES

Knorr-Bremse has identified clear expected environmental benefits for all the eligible categories, and the benefits are assessed to be relevant based on the projects likely to be financed under each category. The identified benefits include greenhouse gas (GHG) emissions reduction, renewable energy generation and energy savings. These benefits are assessed to be measurable and will be quantified in the company's reporting, where feasible. The share of refinancing will be disclosed to investors before the issuance. A look-back period of 24 months has been established, which is transparently disclosed to investors via the green finance framework.

Best practices identified - use of proceeds

- » Eligibility criteria are clearly defined for all project categories
- » Objectives set are defined, relevant and coherent for all project categories
- » Relevant benefits are identified for all project categories
- » Benefits are measurable and quantified for most projects, either ex-ante with clear baselines or with a commitment to do so in future reporting
- » Commitment to transparently disclose the share of proceeds used for refinancing where feasible
- » Commitment to transparently communicate the associated look-back period(s) where feasible

Process for project evaluation and selection



Transparency and quality of process for defining eligible projects – BEST PRACTICES

Knorr-Bremse has established a clear and structured process for the evaluation and selection of eligible green projects, including detailed decision-making criteria, and clearly defined roles and responsibilities formalized in its framework. The company established a Green Finance Committee in charge of supervising the eligible projects together with the business teams, the chief financial officer, and the treasury, sustainability, accounting, investors relations and business development departments. The committee is also in charge of continuously monitoring the compliance of the projects with the relevant eligibility criteria. In case a project is no longer compliant, it will no longer be allocated to the proceeds from the green financing instruments. The decision-making process is documented in the form of committee meeting minutes.

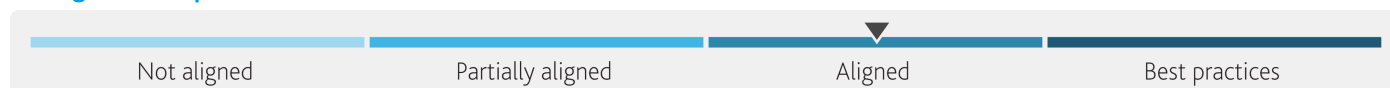
Environmental and social risk mitigation process – BEST PRACTICES

The environmental and social risk mitigation process applied is publicly disclosed. The process implemented is continuous and includes a combination of identification, management, mitigation, monitoring and control measures. The Green Finance Committee is responsible for identifying potential risks or negative externalities associated with financed investments. The environmental management system is embedded in the wider industrial management system governing operations.

Best practices identified - process for project evaluation and selection

- » The roles and responsibilities for project evaluation and selection are clearly defined and include relevant expertise
- » There is evidence of continuity in the selection and evaluation process through the life of the financial instrument(s), including compliance verification and procedures to undertake mitigating actions when needed
- » The process for project evaluation and selection is traceable
- » Material environmental and social risks for most project categories are identified
- » Presence of corrective measures to address environmental and social risks across projects
- » ESG controversies are monitored

Management of proceeds



Allocation and tracking of proceeds – ALIGNED

The issuer has clearly defined the process for the management, allocation and tracking of proceeds in the framework. Proceeds will be placed in the company's general treasury with appropriate means of tracking. The company's treasury department will oversee the allocation and management of proceeds to ensure that the financing of eligible green projects corresponds with the proceeds from the relevant green financing instrument. The balance of the eligible proceeds will be adjusted at least annually. However, the full allocation of proceeds to eligible projects is guaranteed only by the maturity of the respective instrument, and this allocation could potentially extend beyond 24 months after issuance.

Management of unallocated proceeds – ALIGNED

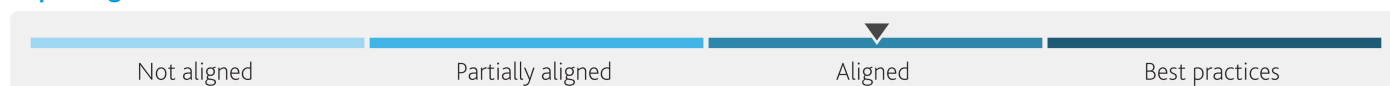
Temporarily unallocated proceeds will be managed within the company's treasury liquidity portfolio at the issuer's own discretion. Excess proceeds are held in cash or other short-term and liquid instruments. The issuer has not provided an explicit commitment to

not invest temporarily unallocated proceeds in GHG-intensive or in high environmental impact activities. In case of postponement or divestment of an eligible project, the issuer will reallocate proceeds to other eligible projects.

Best practices identified - management of proceeds

- » Broad disclosure of a clearly articulated and comprehensive management of proceeds policy to external stakeholders; bondholders or lenders at a minimum
- » Commitment to reallocate proceeds to projects that are compliant with the framework

Reporting



Transparency of reporting – ALIGNED

Knorr-Bremse will report annually and publicly on the use of proceeds raised via issuances under the framework. Reporting will occur until the full allocation of the proceeds and in the event of material changes. Allocation reporting will include a list of outstanding instruments, the nature of projects being financed, the amount of proceeds allocated at the category level and the allocations per eligibility criteria, the expected benefits per category, supported by selected case studies, the share of financing versus refinancing, and the balance of unallocated proceeds.

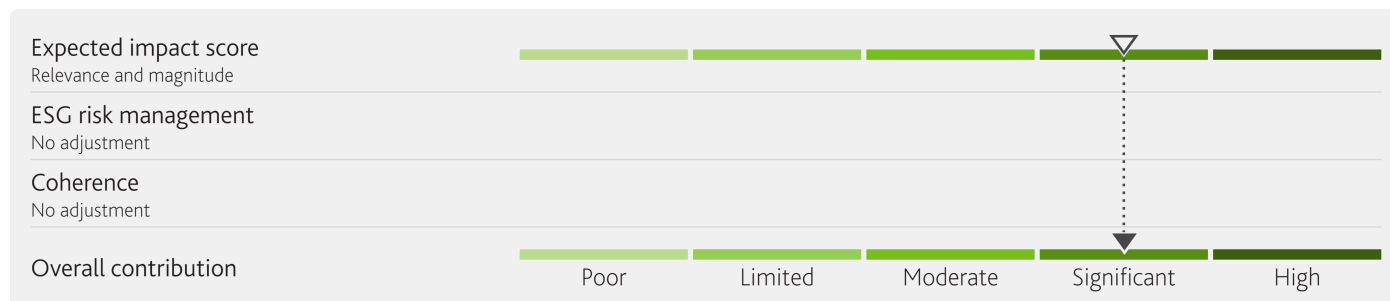
The company will publish an allocation report on its website and has identified relevant environmental reporting indicators for all the eligible categories, which are clearly disclosed in the framework. The calculation methodologies and assumptions used for the environmental indicators will be included. The company will employ an independent external auditor to verify the tracking and allocation of funds to eligible projects or categories, the compliance of projects with the framework and the management of proceeds, at least until the full allocation of proceeds and in case of significant changes. However, there will not be an independent impact assessment of the environmental benefits and externalities associated with the financed projects.

Best practices identified - reporting

- » Reporting covers material developments and issues related to the projects or assets
- » Reporting on allocation of proceeds and benefits done at least at eligible category level
- » Exhaustive allocation reporting – balance or % of unallocated funds, types of temporary investments (e.g. cash or cash equivalent) and share of financing vs re-financing
- » Clear and relevant indicators to report on the expected environmental/social impact of all the projects, where feasible, or eligible categories
- » Disclosure of reporting methodology and calculation assumptions to bondholders or lenders at a minimum
- » Independent audit of the tracking and allocation of funds at least until full allocation and in case of material changes

Contribution to sustainability

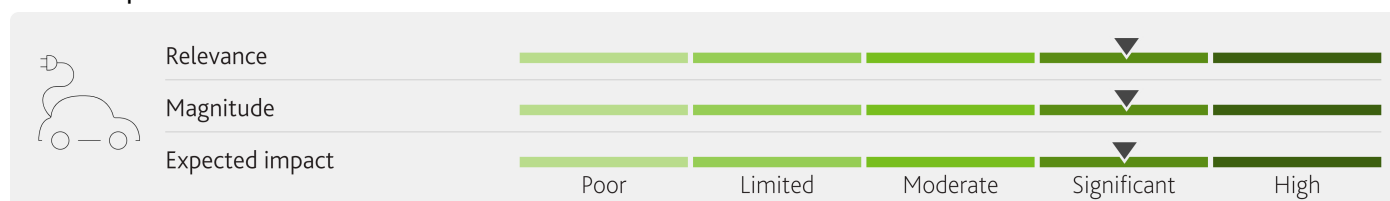
The framework demonstrates a significant overall contribution to sustainability.



Expected impact

The expected impact of the eligible categories on the environmental objective is significant. Based on the information provided by the issuer, we have weighted the categories according to the actual EU Taxonomy-aligned distribution of Capex and Opex for the fiscal year 2023. The proceeds will predominantly be allocated to the financing of clean transportation projects. Renewable energy, energy efficiency and green buildings account for relatively minor shares of the total allocation.

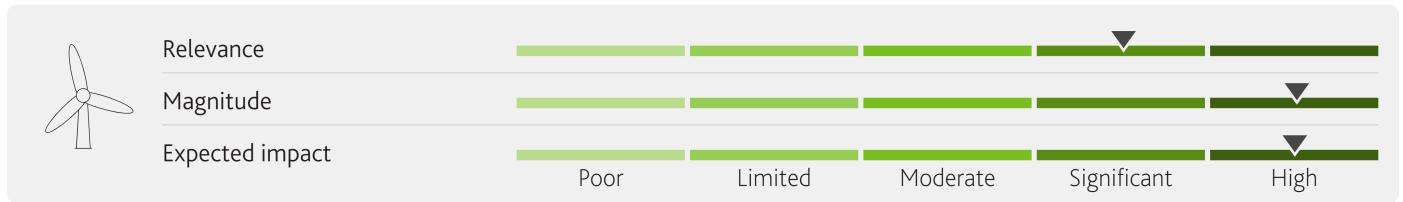
Clean Transportation



Supporting the expansion of electrification in rail and road transport is crucial for addressing the decarbonization needs of the capital goods supply chain in the transportation sector. The eligible projects play a vital role in modernizing transport networks to mitigate climate change and reduce the transport sector's GHG emissions, which constitute a quarter of global GHG emissions. However, although investments in eligible projects promote zero-emission mobility and broader decarbonization efforts in the sector, the direct emission reduction attributable to the issuer's overall GHG emissions could not be provided. In addition, in the sectoral context, efforts to electrify the transportation sector continue alongside the industry's persistent emission of non-exhaust pollutants, known as particulate matter (PM).

The magnitude of the category is significant because the funding is geared toward enabling activities that, although not explicitly green themselves, are essential to the eligible green project's value chain. Knorr-Bremse commits to using all components, products and systems financed under this category exclusively in end products that comply with the substantial contribution criteria of the EU Taxonomy's economic activities: 3.18 - Manufacture of automotive and mobility components, 3.19 - Manufacture of rail rolling stock constituents, 6.14 - Infrastructure for rail transport, and 6.15 - Infrastructure enabling low-carbon road transport and public transport. A significant portion of the funds is likely to be directed toward economic activity 3.19 linked to electrified trains, which are viewed as the most advanced technologies available to promote GHG emissions reductions without any carbon lock-ins. In situations where electric infrastructure is not available, the financing supports bi-mode vehicles that use fossil fuels. On the other hand, the EU Taxonomy's substantial contribution criteria for transport infrastructure investments are less tightly defined, enabling the funding of a wide range of assets with varying expected contributions to the decarbonization of the transportation sector. Against this background, we do not have clear visibility nor any indication about the activities' quantitative positive impact on the environment. In addition, although Knorr-Bremse is dedicated to optimizing brake systems to decrease PM, the company has not set any specific reduction thresholds or compared its systems with industry standards or competitors.

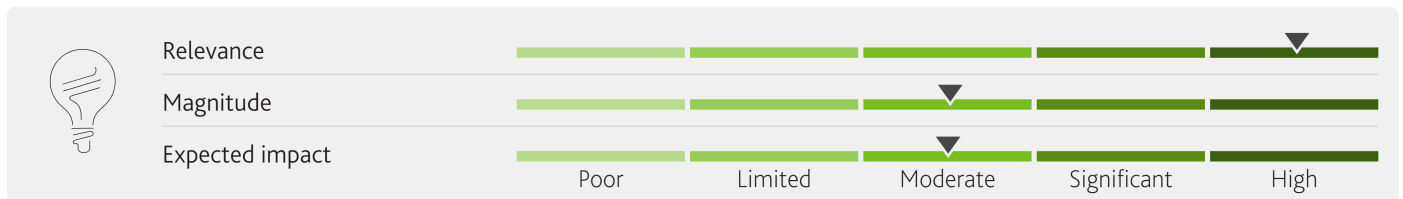
Renewable Energy



Generating renewable energy is significantly relevant to Knorr-Bremse's efforts in mitigating environmental risks. However, clean energy production is not a primary concern for issuers in the manufacturing sector. The self-generated solar photovoltaic (PV) energy used in the issuer's own manufacturing processes accounts for only around 1% of the total energy consumption (as reported in the Sustainability Report 2023). While there is an objective to enhance this percentage, currently, the solar PV energy contributes only to a limited degree to Knorr-Bremse's decarbonization efforts. As the manufacturing processes require significant resources, the primary opportunities for mitigating climate change are closely linked to achieving energy savings throughout the manufacturing stages.

Financing on-ground and on-roof solar PV panels, and to a limited extent heat pumps, will have a high positive long-term impact on climate change mitigation. The eligible projects will comply with the most stringent sector standards, which are the substantial contribution criteria of the EU Taxonomy's economic activity 7.6 - Installation, maintenance and repair of renewable energy technologies. The eligible projects are not expected to result in significant negative environmental externalities or GHG emissions lock-in effects. All projects will be carried out in accordance with environmental impact assessments.

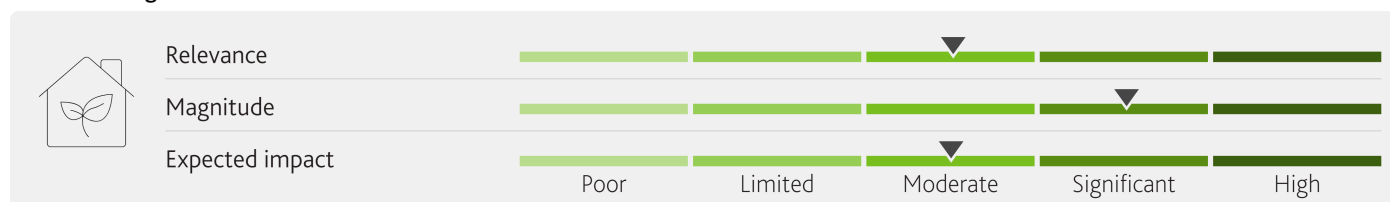
Energy Efficiency



Investments in energy efficiency improvements are highly relevant to the issuer and the industry because of their capacity to address key sustainability challenges and to reduce energy-related emissions in the broader economy. The International Energy Agency's 2023 report notes a 1.3% increase in energy efficiency, indicating less substantial increases compared with 2022 values. To meet the Paris Agreement's net-zero emissions target by 2050, a yearly efficiency improvement of 4% is required throughout this decade². Improving energy efficiency equipment and developing electric vehicle (EV) infrastructure are essential measures to accelerate the transition to clean energy.

Overall, the projects financed under this category will moderately contribute to energy efficiency improvement and climate change mitigation in Knorr-Bremse's manufacturing processes. The issuer references internationally recognized standards to define its eligibility criteria, namely the substantial contribution criteria of the EU Taxonomy's economic activities: 7.3 - Installation, maintenance and repair of energy efficiency equipment, 7.4 - Installation, maintenance and repair of charging stations for EVs in buildings (and parking spaces attached to buildings), and 7.5 - Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings. Economic activity 7.4 ensures a long-term positive impact on the decarbonization of the transportation sector. However, this type of project is likely to receive a minor share of funding within the eligible category. The remaining two economic activities are among those with the least precise specifications of the EU Taxonomy, limiting visibility into their benefits. Notably, economic activity 7.3 that is focused on the installation of energy efficiency equipment is likely to receive the highest share of proceeds. While this activity requires that the equipment complies with stringent, country-specific minimum standards for individual components and systems and fall within the highest two classes of energy efficiency, specific thresholds are not detailed. The variability in national requirements across countries indicates that not all equipment will meet the highest technological standards available on the market. The issuer has yet pledged to only utilize equipment technologies accounting for both technological advancements and regional climate differences. Nevertheless, the issuer has not disclosed any additional technical criteria, quantitative thresholds or details that would provide greater specificity about the projects financed under this category and allow us to determine whether material energy efficiency improvements will be achieved and if the best available technologies will be consistently used.

Green Buildings



Financing the acquisition and management of buildings is moderately relevant to address the key negative environmental impacts of the manufacturing sector. In the EU, buildings account for more than 40% of energy consumption, making them the single most important energy-consuming sector, and are responsible for 36% of energy-related GHG emissions³. However, the acquisition and ownership of buildings constitute a minor share of the manufacturing sector's activities, thus moderately contributing to a positive environmental impact at the industry level. The primary sustainability challenges in this sector are related to energy management, and the sourcing and efficiency of materials.

Projects to improve the energy efficiency of Knorr-Bremse's buildings will significantly contribute to reducing GHG emissions from both the company and the sector's activities. The eligibility criteria, which rely on the EU Taxonomy's substantial contribution criteria for economic activity 7.7 - Acquisition and ownership of buildings, ensures that buildings will achieve a good level of environmental performance. In line with the EU Taxonomy, the issuer has different sets of criteria for buildings built before and after 2021. With regard to acquiring buildings built before 2021, the eligibility criterion of belonging to the top 15% of the country's building stock or classifying level A in the Energy Performance Certificate (EPC) in terms of energy efficiency is considered ambitious, but not the most ambitious threshold in the market. Indeed, because of the high diversity of locations, there is a lack of transparency on whether EPC class A would consistently fall within the top 15% of the applicable national regional stock. Buildings built since 2021 are considered newly constructed. Such buildings can be considered eligible on the basis of an operational emissions threshold alone, a performance that is at least 10% better than a nearly zero-energy building (NZEB). The issuer will conduct a life cycle assessment focusing on the Global Warming Potential (GWP) for such buildings, and will be in line with the EU Taxonomy requirements. However, for both cases, it is uncertain whether the buildings will have an average energy intensity in line with the CRREM 1.5°C pathway⁴.

ESG risk management

We have not applied a negative adjustment to the expected impact score for ESG risk management. The company has allocated significant resources to manage ESG risks, particularly monitoring energy efficiency and GHG emissions. Knorr-Bremse complies with the reporting requirements of the Task Force on Climate-Related Financial Disclosures (TCFD), ensuring a high level of information on the climate-related risks associated with the company's governance, climate and risk management strategy. The issuer also employs an environmental and energy performance management system, including a range of certifications such as ISO 14001, ISO 9001 and ISO 50001, which apply to most of its sites. Additionally, the company ensures the sustainability of its suppliers by implementing a Supplier On-site Sustainability Risk Checklist and conducting audits to evaluate suppliers' performance based on environmental and social norms. Customer Relations risks are relatively low, because the company has no end-consumer exposure, but mainly supplies original equipment manufacturers in the automotive and railway industries.

Coherence

We have not applied a negative adjustment to the expected impact score for coherence. Projects to be financed under Knorr-Bremse's framework align with its broader sustainability strategy. The activities outlined in this framework are likely to substantially contribute to the company's target of reducing its scope 1 and 2 GHG emissions by 75% by 2030 compared with the level in 2018, and scope 3 GHG emissions (specifically 3.1, 3.4 and 3.11, as defined by the GHG Protocol) by 25% by 2030 compared with the level in 2021. The projects financed under the four categories — clean transportation, renewable energy, energy efficiency and green buildings — will collectively reduce Knorr-Bremse's carbon footprint by facilitating low-emission rail and road technologies and other infrastructures.

Appendix 1 - Mapping eligible categories to the United Nations' Sustainable Development Goals

The four eligible categories included in Knorr-Bremse's green finance framework are likely to contribute to three of the UN's SDGs, namely:

UN SDG 17 Goals	Eligible Category	SDG Targets
GOAL 7: Affordable and Clean Energy	Renewable Energy	7.2: increase substantially the share of renewable energy in the global energy mix
	Energy Efficiency	7.3: Double the global rate of improvement in energy efficiency
GOAL 9: Industry, Innovation and Infrastructure	Energy Efficiency	9.4: Upgrade infrastructure and retrofit industries to make them sustainable, with all countries taking action
	Green Buildings	
GOAL 13: Climate Action	Clean Transportation	13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
	Renewable Energy	
	Energy Efficiency	
	Green Buildings	

The mapping of the UN's SDGs in this SPO considers the eligible project categories and associated sustainability objectives/benefits documented in the issuer's green finance framework, as well as resources and guidelines from public institutions, such as the ICMA's SDG Mapping Guidance and the UN's SDG targets and indicators.

Appendix 2 - Summary of eligible categories in Knorr-Bremse's green finance framework

Eligible Category	Description	Sustainability Objective	Impact Reporting Metrics
Clean Transportation	<ul style="list-style-type: none"> - Manufacture, repair, maintenance, retrofitting, repurposing, and upgrade of mobility components for zero-emission personal mobility devices and of automotive and mobility systems, components, separate technical units, parts, and spare parts, essential for delivering and improving the environmental performance of end vehicles of the categories M1, M2, M3, N1, N2, and N3 - Manufacture, installation, technical consulting, retrofitting, upgrade, repair, maintenance, and repurposing of products, equipment, systems, and software related to defined rail constituents - Construction, modernisation, maintenance and operation of infrastructure that is required for zero tailpipe CO₂ operation of zero-emissions road transport, as well as infrastructure dedicated to transshipment, and infrastructure required for operating urban transport <p>Projects to fulfill the substantial contribution criteria of the EU Taxonomy under the following economic activities:</p> <ul style="list-style-type: none"> - 3.18 Manufacture of automotive and mobility components - 3.19 Manufacture of rail rolling stock constituents - 6.14 Infrastructure for rail transport - 6.15 Infrastructure enabling low-carbon road transport and public transport 	Climate Change Mitigation	<ul style="list-style-type: none"> - Number of vehicles equipped with Knorr-Bremse products (separated by rail vehicles and trucks) - Reduced emissions (on case study level)
Renewable Energy	<ul style="list-style-type: none"> - Installation, maintenance, and repair of renewable energy technologies, on-site <p>Projects to fulfill the substantial contribution criteria of the EU Taxonomy under the following economic activities:</p> <ul style="list-style-type: none"> - 7.6 Installation, maintenance and repair of renewable energy technologies 	Climate Change Mitigation	- Annual renewable energy generation in MWh/GWh (electricity) and GJ/TJ (other energy)
Energy Efficiency	<ul style="list-style-type: none"> - Individual renovation measures consisting in installation, maintenance, or repair of energy efficiency equipment - Installation, maintenance, and repair of charging stations for electric vehicles in buildings (and parking spaces attached to buildings) - Installation, maintenance, and repair of instruments and devices for measuring, regulation, and controlling energy performance of buildings <p>Projects to fulfill the substantial contribution criteria of the EU Taxonomy under the following economic activities:</p> <ul style="list-style-type: none"> - 7.3 Installation, maintenance and repair of energy efficiency equipment - 7.4 Installation, maintenance and repair of charging stations for electric vehicles in buildings (and parking spaces attached to buildings) - 7.5 Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings 	Climate Change Mitigation	<ul style="list-style-type: none"> - Annual energy savings in MWh/GWh (electricity) and GJ/TJ (other energy savings) - Estimate of annual GHG emissions reduced/avoided during production (tCO₂e)
Green Buildings	<ul style="list-style-type: none"> - Buying real estate and exercising ownership of that real estate <p>Projects to fulfill the substantial contribution criteria of the EU Taxonomy under the following economic activities:</p> <ul style="list-style-type: none"> - 7.7 Acquisition and ownership of buildings 	Climate Change Mitigation	<ul style="list-style-type: none"> - Annual GHG emissions reduced/avoided in tCO₂e. vs local baseline/baseline certification level - % of energy use reduced/avoided vs local baseline/building code

Endnotes

- [1](#) The point-in-time assessment is applicable only on the date of assignment or update.
- [2](#) International Energy Agency, [Energy Efficiency](#), retrieved in August 2024.
- [3](#) European Commission, [In Focus: Energy Efficiency in Buildings](#), 2020.
- [4](#) CRREM, [Decarbonisation Pathways](#), retrieved in August 2024.

Moody's assigns SPOs in alignment with the main tenets of the ICMA Guidelines for Green, Social, Sustainability and Sustainability-Linked Bonds External Reviews and the LSTA/LMA/APLMA Guidance for Green, Social and Sustainability-Linked Loans External Reviews, as applicable; Moody's practices may however diverge in some respects from the practices recommended in those documents. Moody's approach to assigning SPOs is described in its Assessment Framework, and is subject to the ethical and professional principles set forth in the Moody's Investors Service Code of Professional Conduct.

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