# **News Release**



Japan Credit Rating Agency, Ltd. 21-D-0544 August 31, 2021

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## Third Party Opinion on Positive Impact Finance by Sumitomo Mitsui Trust Bank, Limited to Kawasaki Heavy Industries, Ltd.

Japan Credit Rating Agency, Ltd. (JCR) provided a third party opinion for the Positive Impact Finance delivered by Sumitomo Mitsui Trust Bank, Limited to Kawasaki Heavy Industries, Ltd.

#### <Executive Summary>

This third party opinion examines the suitability of the Positive Impact Finance (PIF) to be delivered by Sumitomo Mitsui Trust Bank, Limited (SMTB) to Kawasaki Heavy Industries, Ltd. (KHI) (the Finance) for the Principles for PIF and the Model Framework for Financial Products for Corporates with unspecified use of funds (Model Framework) established by the United Nations Environmental Programme Finance Initiative (UNEP FI). To ensure the transparency and objectivity of the assessment recommended in the Principle four of PIF, Japan Credit Rating Agency, Ltd. (JCR), as an independent third-party organization, examined (1) the rationality of the PIF evaluation of KHI and the impacts of the Finance, and (2) the compliance of SMTB's PIF evaluation framework and the Finance with the Principles for PIF.

#### (1) Rationality of the PIF evaluation of KHI and the impacts of the Finance

KHI is a leading comprehensive heavy machinery manufacturer with operations in aerospace systems, energy solutions and marine engineering, precision machinery and robotics, motorcycles and engines, and rolling stock. In 2020, the company formulated its Group Vision 2030, which focuses on three key fields: Safe and Secure Remotely Connected Society, Near-Future Mobility, and Energy and Environmental Solutions. In 2017, the company formulated the Kawasaki Global Environmental Vision 2050, which is based on the pillars of three FREEs: CO<sub>2</sub> FREE (zero CO<sub>2</sub> emissions), Waste FREE (zero waste), and Harm FREE (zero hazardous chemicals). In order to realize this vision, it has formulated and implemented a three-year Basic Plan for Environmental Management Activities. In the Materiality section, which was reviewed in 2021, the three priority fields in the Group Vision 2030 were identified as "social value created through the business," and the three pillars of the Kawasaki Global Environmental Vision 2050 were identified as elements of the "foundation supporting business activities." The company holds regular meetings of the Sustainability Committee and the Corporate Environment Committee to deliberate and decide on various sustainability-related measures and to monitor the status of achievement and compliance, and promotes various initiatives.

Regarding the Finance, holistic analysis of KHI's overall business activities was conducted. On the basis of the result of the analysis and the above sustainability activities, the following five impacts were selected after impact identification: (1) Realization of a safe and secure remotely-connected society, (2) Realization of a near-future mobility society, (3) Realization of a decarbonized society by energy and environmental solutions, (4) Waste FREE, and (5) Harm FREE. And impact indicators (KPIs) were set for each impact.

Impacts (1) through (3) are positive impacts related to the three priority fields set forth in the Kawasaki Group Vision 2030, including the enhancement of medical care using robotic assisted surgery system and the establishment of a hydrogen supply chain. Impacts (3) to (5) are negative impacts related to the three pillars of the Kawasaki Global Environmental Vision 2050, including the reduction of  $CO_2$  emissions, waste, and hazardous chemicals. Monitoring will be conducted on the above KPIs for these five impacts.



Along the items to consider listed in the Model Framework, JCR examined the holistic analysis and the impact identification in the Finance, so that JCR assessed them as appropriate analysis. Along the criteria to rate PIF listed in the Principles for PIF, JCR examined the impacts based on the KPI of the Finance, so that JCR evaluated the Finance was expected to have variety, magnitude, efficiency, and additionality. Accordingly, JCR assessed the KPI as appropriate indicators in light of the above impact identification, sustainability activities, and impact evaluation. JCR also assessed the monitoring policy in the Finance as an appropriate way in light of the impact identification and the KPI in the Finance. Consequently, JCR assessed that the holistic impact analysis (impact identification, assessment, and monitoring) of the Model Framework to grasp the three dimensions in relation to SDGs (environmental, social, and economic) is adequately implemented in the Finance.

## (2) Compliance of SMTB's PIF evaluation framework and the Finance with the Principles for PIF

Along the Principles for PIF, JCR examined SMTB's process, methodology, internal regulation, and internal system for PIF arrangement and arranging the PIF for KHI, so that JCR assessed they comply with all the requirements.

From the above, JCR confirmed the Finance is suitable for the Principles for PIF and the Model Framework.



### Third Party Opinion

Subject of assessment: Sumitomo Mitsui Trust Bank, Limited's positive impact finance to Kawasaki Heavy Industries, Ltd.

August 31, 2021 Japan Credit Rating Agency, Ltd.





### Contents

Sum	1mary 3 -
I.	Positioning and purpose of the third party opinion
П.	Summary of the third party opinion 5 -
III.	PIF evaluation of KHI, etc 6 -
1.	Overview of KHI's Sustainability Activities 6 -
	1-1. Business Overview 6 -
	1-2. Sustainability achievements
	1-3. Sustainability Structure and Operational Procedures 8 -
2.	Assessment of Appropriateness of Holistic Analysis and Impact Identification 13 -
	2-1. Overview of Holistic Analysis and Impact Identification 13 -
	2-2. Assessment by JCR 14 -
3.	Assessment of Appropriateness of KPIs and Impact 16 -
	3-1. Overview of KPI Setting 16 -
	3-2. Assessment by JCR 38 -
4.	Assessment of Appropriateness of Monitoring Policies 42 -
5.	Assessment of Use of the Model Framework 42 -
IV.	Compliance with the Principles for PIF $43$ -
1.	Principle 1: Definition 43 -
2.	Principle 2: Frameworks 44 -
3.	Principle 3: Transparency 45 -
4.	Principle 4 Assessment 46 -
V.	Conclusion 46 -



#### Summary

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(1) Rationality of the PIF evaluation of KHI and the impacts of the Finance

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Regarding the Finance, holistic analysis of KHI's overall business activities was conducted. On the basis of the result of the analysis and the above sustainability activities, the following five impacts were selected after impact identification: (1) Realization of a safe and secure remotely-connected society, (2) Realization of a near-future mobility society, (3) Realization of a decarbonized society by energy and environmental solutions, (4) Waste FREE, and (5) Harm FREE. And impact indicators (KPIs) were set for each impact.

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Along the items to consider listed in the Model Framework, JCR examined the holistic analysis and the impact identification in the Finance, so that JCR assessed them as appropriate analysis. Along the criteria to rate PIF listed in the Principles for PIF, JCR examined the impacts based on the KPI of the Finance, so that JCR evaluated the Finance was expected to have variety, magnitude, efficiency, and additionality. Accordingly, JCR assessed the KPI as appropriate indicators in light of the above impact identification, sustainability activities, and impact evaluation. JCR also assessed the monitoring policy in the Finance as an appropriate way in light of the impact identification and the KPI in the Finance. Consequently, JCR assessed that the holistic impact analysis (impact identification, assessment, and monitoring) of the Model Framework to grasp the three dimensions in relation to SDGs (environmental, social, and economic) is adequately implemented in the Finance.

(2) Compliance of SMTB's PIF evaluation framework and the Finance with the Principles for PIF

Along the Principles for PIF, JCR examined SMTB's process, methodology, internal regulation, and internal system for PIF arrangement and arranging the PIF for KHI, so that JCR assessed they comply with all the requirements.

From the above, JCR confirmed the Finance is suitable for the Principles for PIF and the Model Framework.



#### I. Positioning and purpose of the third party opinion

JCR conducted a third party assessment of the PIF to be provided by SMTB to KHI in accordance with the Principles for PIF and the Model Framework formulated by UNEP FI. PIF refers to an operation to identify and assess the positive impact of the corporate activities, and to provide and monitor loans and other financing with the aim of contributing to the realization of a sustainable society by promoting corporate activities aimed at achieving the goals of the SDGs through the review and assessment of such activities by financial institutions and the like.

The Principles for PIF consist of the four principles: The first principle is to ensure that positive results have been achieved on the three pillars (environmental, social and economic) that contribute to the SDGs, and that negative impacts have been identified and mitigated; the second principle is to develop an evaluation framework that includes adequate processes, methodologies and evaluation tools for providing the PIF; the third principle is to ensure transparency in the details of the project to measure positive impact and the like, evaluation and monitoring processes, and positive impacts; and the fourth principle is to ensure that PIF products have been assessed internally or by a third party.

To ensure the transparency and objectivity of the assessment recommended in the PIF Principle 4, the third party opinion was issued by JCR as an independent third party to examine the rationality of the PIF evaluation of KHI and the impacts of the Finance, as well as the compliance of SMTB's PIF evaluation framework and the Finance with the Principles for PIF, and to examine the suitability of the Finance for the Principles for PIF and the Model Framework.

#### II. Summary of the third party opinion

The third party opinion is an expression of opinion on the PIF with an unspecified use of funds, for which SMTB enters into an agreement with KHI on August 31, 2021, and consists of the following items.

< PIF evaluation of KHI, etc.>

- 1. Overview of KHI's Sustainability Activities
- 2. Assessment of Appropriateness of Holistic Analysis and Impact Identification
- 3. Assessment of Appropriateness of KPIs and Impact
- 4. Assessment of Appropriateness of Monitoring Policies
- 5. Assessment of Use of the Model Framework

<SMTB's PIF evaluation framework, etc.>

- 1. Whether the products structured by SMTB (PIF) comply with UNEP FI's the Principles for PIF and the relevant guidelines (including whether processes and product structuring methods are appropriate, and whether they have been set out in internal documents).
- Whether SMTB has properly structured the PIF for KHI in accordance with its internal rules and regulations



#### **III.** PIF evaluation of KHI, etc.

In this section, JCR examines the use of the holistic impact analysis (impact identification, assessment, and monitoring) of the Model Framework in the PIF evaluation for KHI and the impact of the Finance (i.e., (1) variety, (2) magnitude, (3) efficiency, (4) leverage, and (5) additionality).

#### 1. Overview of KHI's Sustainability Activities

#### 1-1. Business Overview

Since its establishment in 1896, KHI has expanded its business across a wide range of areas on land, at sea, and in the air, based on the philosophy of its founder, Shozo Kawasaki, to "serve the nation and society through our technologies." KHI has developed an aerospace systems business, energy solutions and marine engineering business, precision machinery and robotics business, motorcycle and engine business, and rolling stock business to provide an array of products and services with new value by leveraging the synergy of the advanced technological capabilities of each company.

KHI plans to spin off its rolling stock business and motorcycle and engine business in October 2021, with the intention of not only ensuring autonomous management but also flexible and agile collaboration with companies in these industries.

✓ Aerospace Systems Business

KHI has participated in international development and production projects for Boeing 787 and other commercial aircraft, and has developed and manufactured aircraft for the Ministry of Defense. In addition to the production of helicopters and space equipment, it deploys a wide range of technologies, including turbofan engines for passenger aircraft and turboshaft engines for helicopters, and participates in and provides technologies for R&D projects in Japan and overseas.

#### ✓ Energy Solution & Marine Engineering Business

As of April 1, 2021, the former Energy and Environment Plant Business and the former Ship and Offshore Structure Business were integrated with the aim of applying the technologies cultivated in the LNG-related business to the hydrogen-related business and accelerating the development of advanced technologies such as automatic ship operation.

In this business, KHI provides a full range of services from the design to sale of diverse industrial plant for cement, chemicals, non-ferrous metals and other commodities, as well as environmental protection facilities such as municipal waste incineration plants. It also owns two shipyards, one in Kobe and the other in Sakaide (Kagawa Prefecture), which provide development, construction, and maintenance services for ships, mainly LNG carriers, LPG carriers, submarines, and other high-value-added vessels. It has been conducting research and development into the hydrogen business since 2009, ahead of its competitors. With the



integration of the businesses in April 2021, it has positioned the hydrogen energy-related business as its core business and expanded its business to build a supply chain that encompasses "producing," "storing," and "consuming" hydrogen.

✓ Precision Machinery & Robot Business

KHI manufactures hydraulic machinery for use in construction machinery, industrial machinery, and ships. It also supplies a large number of Kawasaki robots for welding, assembly and handling, coating, and palletizing to the automotive, electrical, and electronics industries. In addition, it has established a PCR testing business using robots, taking advantage of its technological and other capabilities through which Japan's first robot was developed and manufactured in 1968. In March 2021, it launched Japan's first automated PCR testing service business using robots made by KHI at Fujita Health University.

✓ Motorcycle & Engine Business

KHI manufactures a wide range of products, including motorcycles, ATVs (four-wheeled buggies), recreational utility vehicles, multi-purpose vehicles, JET SKI® personal watercraft, and general-purpose gasoline engines, in Japan, the United States, and countries in South America and Asia, and supplies them to markets around the world.

✓ Rolling stock business

KHI supplies an array of rolling stock to the world, including trains such as the Shinkansen, passenger cars, freight cars, locomotives, diesel locomotives, and new transportation systems. With the Hyogo Works as its mother factory, it has three production bases in Japan and the United States to meet the global demand for rolling stock.

#### 1-2. Sustainability achievements

The details of KHI's sustainability initiatives, targets, management status and results can be found in the Kawasaki Report (integrated report), the Kawasaki Environmental Report, the Kawasaki ESG Data Book, and on its website. The achievements of its social, environmental, and economic initiatives are disclosed through a range of media, making it easy for stakeholders to monitor them.

To realize the Group's mission "Kawasaki, working as one for the good of the planet," which was established in line with its founding principles, KHI proactively identifies social issues, takes on the challenge of solving these issues through the pursuit of synergies and innovation within the Group, and works to create new value.

Specifically, the Corporate Technology Division mediates the technological core competence of each company and incorporates these competences in the products of other companies, thereby enabling the multifaceted development of technology and generating significant synergies. By adopting matrix-based operations, which combines the core technologies of its company divisions with the fundamental technologies of the Corporate Technology Division, the Kawasaki Group as a



whole is creating Technology Synergies and promoting the development of innovative new products.

KHI's R&D has been highly recognized externally, winning the Clarivate Top 100 Global Innovators from Clarivate Analytics for six consecutive years since 2015. When winning the award in 2021, KHI earnings high marks for its Globality (the percentage of the world's major markets that place a high value on its portfolio) and its Impact (the impact of its invention after it has been patented).

KHI is working to reform its organization and corporate culture, as well as to undertake Kawasaki Workstyle Innovation Activities (K-Win Activities) and promote diversity, based on the idea of "The Kawasaki Group's corporate culture is built on integrity, vitality, organizational strength and mutual respect for people through all levels of the Group. We nurture a global team for a global era." as cited in the Kawasaki Group Management Principles of the Kawasaki Group Mission Statement. K-Win Activities, which began in fiscal 2016 as a part of the work style reform, have expanded to include all corporate reform activities (the Kawasaki Workstyle Innovation Project Department was established in the Human Resources Division in fiscal 2020), and has successfully created an organization that generates a virtuous circle to increase corporate value. To encourage diversity, KHI aims to respect the diversity of the approximately 36,000 globally active Group employees. It is not only developing internal systems such as support measures and seminars, but is also collaborating with external organizations. For instance, it participates in the Work-Life Balance and Diversity Promotion and Research Project jointly conducted by the Graduate School of Strategic Management, Chuo University and private companies.

KHI also announced its endorsement of the Task Force on Climate-Related Financial Disclosures (TCFD) recommendations in September 2019, and the entire group is actively working to further promote initiatives on climate change issues and disclose climate-related information in line with the TCFD recommendations. In March 2021, KHI endorsed Keidanren's Challenge Zero (Challenge Net Zero Carbon Innovation) and posted two initiatives: the establishment of an international liquefied hydrogen supply chain and the development of hydrogen power generation technology. In addition, it signed the United Nations Global Compact in January 2020.

KHI has also been included in external ESG investment indices such as DJSI Asia Pacific, FTSE 4Good Index, FTSE Blossom Japan Index, and MSCI Japan ESG Select Leaders Index, and has received the highest rating of Gold in the PRIDE Index 2020 for three consecutive years.

#### 1-3. Sustainability Structure and Operational Procedures

#### (1) Organizational structure for sustainability

KHI has established a Sustainability Committee to deliberate and decide on measures that contribute to the mutual sustainability of society, environment and the Kawasaki Group, and to the enhancement of the corporate value of the Kawasaki Group. The committee also tracks the execution



and achievement of these measures, and determines other measures to identify, eliminate, and mitigate the negative impact of its business activities on society and the environment, and tracks the execution and achievement of those measures. The Committee is chaired by the president and consists of directors, company presidents, persons in charge of sustainability, and the general managers of the head office divisions, as well as outside directors with the aim of reflecting their knowledge and opinions in the committee's decision-making. Discussions at the Committee are reported to the Board of Directors on a regular basis.

KHI promotes the Group's sustainability activities with the Planning Department of the Sustainable Development Division playing a central role, and with the Sustainability Planning Working Group supporting and cooperating with "the sustainability activities promoted and implemented by each company, including consolidated subsidiaries." In this way, it has established a system to promote sustainability throughout the entire Group.



Figure 1 Sustainability promotion structure<sup>1</sup>

#### (2) Materiality in sustainability

KHI has identified materiality issues to be addressed by the Group in fiscal 2017 and has reviewed the framework of its sustainability activities, positioning "social value created through business" as the most important issue to be achieved by the Group over the long term, and other issues as "foundations supporting business activities."

And in June 2021, it changed the "social value created through the business" into the three priority fields (Safe and Secure Remotely-Connected Society, Near-Future Mobility, and Energy and

<sup>1</sup> Source: Materials provided by KHI



Environmental Solutions) in the Group Vision 2030 announced in November 2020. KHI will continue to review its materiality on a regular basis in line with changes in the business environment and social expectations.

It is working to promote sustainability activities by clarifying the departments and people responsible for the identified materiality, the goals to be achieved, and the KPIs, as well as by steadily implementing and following up on the PDCA cycle.

#### (3) Company-wide risk policy, management system, and achievements

KHI, which operates in a wide range of fields and aspires to global business, conducts integrated risk management on a company-wide basis in accordance with the Risk Management Rules in the company regulations. It has established a Company-Wide Risk Management Committee (Chief Risk Management Officer: the president, Risk Management General Manager: the officer in charge) to deliberate on important matters related to risk management and to monitor the status of risk management, thereby strengthening the company-wide risk management system. The Committee aggregates the important risks identified by each business unit, deliberates on their importance, and identifies important risks with a significant impact on management (company-wide recognized risks). Such risks are monitored annually at the end of the fiscal year (March) by the department responsible for monitoring at the head office.

In addition, KHI has established an office in the Risk Management Department of the Head Office Corporate Planning Division to promote and support company-wide risk management with the cooperation of the Head Office departments. To work on company-wide risk management, it has also constructed a similar system in each company and division with the general manager of the business unit as the responsible person. It has already established a system covering domestic group companies, while risk management activities are being carried out at major consolidated subsidiaries (model companies) overseas.

With respect to procurement in the supply chain, it has built a PDCA cycle using its own questionnaire consisting of items such as compliance, human rights, labor, safety and health, and consideration for the global environment, which are required to be addressed as risks. KHI regularly monitors the sustainability status of suppliers, conducts evaluations based on uniform standards across the Group, provides feedback to suppliers, and follows up on low-rated companies to raise supplier awareness and efficiently and effectively reduce sustainability risks in the supply chain.

In addition, KHI has introduced the concept of the Green Value Chain, a unique method that analyzes the "environmental impact (aspects and effects)" and "risks and opportunities" at each process from the procurement of raw materials to the disposal of products. In fiscal 2021, it plans to





set KPIs for energy, raw material, and water consumption, as well as air emission, waste, and sewage emission, at each process, and to enhance efforts to establish a sustainable supply chain over the medium to long terms.

As described above, KHI is striving to reduce social and environmental risks throughout its supply chain.

#### (4) Management system concerning product liability and export control system

In addition to complying with laws and regulations related to security trade control, KHI has defined its corporate rules titled Rules for the Provision of Products and Services Based on Corporate Ethics, with the aim of preventing the unwanted use of products and technologies by appropriately determining their intended use at the destination. Also, the Kawasaki Heavy Industries Group Business Conduct Guideline states, "We do not provide products and technologies for unethical use," stipulating that it should recognize its ethical responsibility when providing the Group's products and technologies. KHI deliberates and decides on measures to ensure compliance and conducts compliance monitoring in accordance with the Rules for the Provision of Products and Services Based on Corporate Ethics and the Kawasaki Group Code of Conduct.

With regard to the export control system, it has set the Kawasaki Group Policy on Export Control, which sets forth the principles of conduct in export control. Thereby, a strict control system has been built to prevent the provision of products and services to transactions aimed at the development of weapons of mass destruction or the excessive accumulation of conventional weapons, and appropriate security export controls have been implemented. To ensure that the entire company complies with export-related laws and regulations, it has set the corporate export control regulations for goods and technologies relevant to security maintenance as a corporate rule and built an export control system in which the director with representative rights serves as the chief export control officer.





Figure 2: Export control system<sup>2</sup>

 $<sup>^2</sup>$  Source: Materials provided by KHI



2. Assessment of Appropriateness of Holistic Analysis and Impact Identification

2-1. Overview of Holistic Analysis and Impact Identification

Regarding the Finance, a holistic analysis of KHI's overall business activities was conducted, and impacts were identified on the basis of it and the sustainability activities described above.

#### (1) Holistic Analysis

In terms of segments, areas, and supply chains, impact producing factors were comprehensively examined across the group.

First, looking at the overall business by segment on a sales basis (FY2020), the aerospace systems business accounts for 25.4%, energy system & plant engineering 16.1%, precision machinery & robot 16.2%, motorcycle & engine 22.6%, ships & offshore structure 5.3%, and rolling stock 8.9%. Looking at the overall business in terms of area on a sales basis (FY2020), Japan accounts for 47.3% and overseas accounts for 52.7% (21.1% in the US, 18.6% in Asia, 9.6% in Europe, and 3.4% in other areas).

To realize the Kawasaki Global Environmental Vision 2050 and the Group Vision 2030, which were formulated based on the Kawasaki Group's mission of "Kawasaki, Working as One for the Good of the Planet," KHI is promoting materiality across the board. It has stated that it will contribute to solving global social issues by utilizing its customer base and innovative technologies. Therefore, the above businesses were comprehensively analyzed on a global basis in order to gain a company-wide overview of the impact created by these activities. In addition, the major positive and negative impacts of each stage of the product life cycle were identified and analyzed.

#### (2) Impact identification

With the impact analysis tool established by UNEP FI, the categories where positive and negative impacts occur were confirmed. In principle, the impact analysis was conducted based on publicly available data from KHI. For important points, however, the procedures were supplemented by confirming supporting internal documents and the like and conducting interviews.



#### 2-2. Assessment by JCR

Along the items to consider listed in the Model Framework, JCR examined the holistic analysis and the impact identification in the Finance, so that JCR assessed them as appropriate analysis.

Points to be confirmed in the Model Framework	Confirmation result by JCR
Consideration of the operating context of the	A holistic analysis of KHI's overall business
Corporate given its sector and type of activity,	activities has been conducted in terms of
including the key relevant sustainability	business segments, business areas and supply
challenges in its operating location/countries of	chain to identify the impact.
operations and whether the Corporate's activities	
contribute to these.	
Consideration of relevant market practices and	KHI is a signatory to the United Nations Global
standards (e.g. UN Global Compact Principles,	Compact. In addition, it is confirmed that KHI
etc.) and whether the Corporate adheres to these.	supports the TCFD recommendations and is
	working to implement them.
Consideration of the Corporate's strategic intent	Impacts have been identified based on Group
and/or commitments to deliver positive impacts	Vision 2030, Kawasaki Global Environmental
and/or manage negative impacts, as publicly	Vision 2050, Materiality, and the like published
expressed in corporate social responsibility	by KHI.
(CSR) reports, integrated reports or other public	
information.	
Use of taxonomies, as drawn up by global	The identified positive impacts include "Circular
initiatives such as the Green Bond Principles or	economy adapted products, production
at the country level, to identify a priori positive	technologies and processes and/or certified
impact sectors or activities and/or geographic	eco-efficient products" stated in the project
locations (e.g. low or middle income countries)	categories of the Green Bond Principles, and
or types of economic actors (e.g. small and	"Affordable basic infrastructure", "Access to
medium size enterprises).	essential services," "Socioeconomic
	advancement and empowerment," stated in the
	project classification of the Social Bond
	Principles.
Consideration of the Product Initiator's	It has been confirmed that KHI does not fall
exclusion lists, if any.	under the category of an ineligible company
	based on the financing and other policies set
	forth by SMTB.
Consideration of the Corporate's involvement in	Identified important negative impacts
sensitive activities, i.e. activities that can trigger	concerning KHI's operations, including



significant negative impacts when not conducted	greenhouse gas emissions, waste, and emissions
in a sustainable way.	of hazardous chemicals. These have been
	recognized as matters to be reduced in the
	Kawasaki Global Environmental Vision 2050,
	Materiality and the like.
Screening of available information regarding	In principle, SMTB identified impacts based on
possible controversies to identify possible	publicly available information of KHI. For
negative impacts linked to the Corporate's	important points, however, the procedures were
activities, and/or apparent contradictions	supplemented by confirming supporting internal
between its communicated intents and its actual	documents and the like and conducting
practice (e.g. behaviour vis-à-vis stakeholders in	interviews. JCR interviewed KHI based on the
its supply chain, or amongst its employees).	PIF assessment report prepared by SMTB, and
	confirmed that there is a consistency between the
	disclosed information and the actual actions.



- 3. Assessment of Appropriateness of KPIs and Impact
- 3-1. Overview of KPI Setting

Regarding the Finance, on the basis of the above impact identification and sustainability activities, the following five impact items were selected and KPIs were set for each: (1) Realization of a safe and secure remotely-connected society, (2) Realization of a near-future mobility society, (3) Realization of a decarbonized society by energy and environmental solutions, (4) Waste FREE, and (5) Harm FREE.

	Relationship between impact terms and materianity in the assessment		
	Impact items	Relevant materiality, etc.	SDGs
1	Realization of a safe and secure remotely-connected society	Safe and secure remotely-connected society	3.8, 8.2, 9.5, 17.17
2	Realization of a near-future mobility society	Near-future mobility	3.8, 9.1, 9.5, 11.2
3	Realization of a decarbonized society by energy and environmental solutions	Energy and environmental solutions, energy and environmental solutions (Value chain)	7.1, 7.2, 7.3, 7.a, 9.4, 9.5, 13.1, 17.17
4	Waste FREE	Energy and environmental solutions (Value chain)	12.2, 12.5
5	Harm FREE	Energy and environmental solutions (Value chain)	12.4

#### Relationship between impact items and materiality in the assessment

(\*) Of the SDGs identified in the Materiality, those identified in the Finance are listed as SDGs related to impact and specific contributions.



#### (1) Realization of a safe and secure remotely-connected society

✓ Increasing positive impact

✓ Relevance to the SDGs

3. Good health and well-being, 8. Decent work and economic growth, 9. Industry, innovation and

infrastructure, 17. Partnerships for the goals

✓ Impact category

Health and sanitation, Employment

✓ Details

Provide a remotely-connected environment and propose new ways of working and living to realize the participation of all people in society, regardless of time or location.

✓ Action policy

(a) Industrial robots

Build a remote control platform for robots and realize remote work in a 3D workplace.

(b) Robotic assisted surgery system

Reduce patient burden and enable remote surgery with minimal medical staff through

widespread use of robots

(c) Automated PCR testing system

Reduce secondary infections and the burden on healthcare workers through the introduction of automated PCR testing systems and patient monitoring robots.

✓ Goals and Indicators (KPI)

(a) Industrial robots

Goal: Contribution to dissolving the shortage of labor force in Japan

Indicator (KPI): Number of active users of remote platforms

(b) Robotic assisted surgery system

Goal: Increase in sales of robotic assisted surgery systems

Indicators (KPI): Sales of robotic assisted surgery systems

(c) Automated PCR testing system

Goal: Establishment of PCR Testing System

Indicator (KPI): Number of PCR tests

KHI, which started its industrial robot business in June 1968, has for the past 50 years been supplying a large number of Kawasaki robots to the automotive, electrical and electronics industries, as well as other industries in Japan and overseas, contributing to industrial development through



automation and labor saving. In recent years, robots have been used in a broader array of fields, including food, pharmaceutical, and medical areas. Harnessing the technologies it has cultivated with industrial robots, KHI as a comprehensive robot manufacturer is working to provide new solutions through the construction of remote robot factories, robotic assisted surgery system, and automatic PCR inspection systems in order to meet the growing demand for robots in the wake of COVID-19, the declining workforce, aging population, the shift to a high-mix low-volume production system, and social demands such as COVID-19 countermeasures.

#### (a) Industrial robots

KHI and Sony Group Corporation have agreed to jointly establish a new company in the summer of 2021 to operate a remote robot platform business. The new company will combine KHI's long-cultivated robotics technologies and system engineering with Sony's strengths in image processing, sensing and communication technologies to create a remote robot platform through which robots can be remotely operated, and will mainly provide robot software and solution services. Through the platform, KHI aims to develop services based on communities that remotely connect robots, workers, and businesses, to ensure the safety of workers in hazardous work environments and at sites requiring heavy manual labor, to significantly reduce the workload, and to realize a new work style unrestricted by location or time.

As it enables people who have been away from work for various reasons to work remotely from their homes using the remote robot platform, it is expected to create work opportunities and contribute to solving labor shortages caused by the declining birthrate and aging population. In addition, the platform is expected to promote the revitalization of employment by connecting workers willing to work with businesses willing to hire them and building a new community. The service is scheduled to be launched by the end of 2022, following verification tests in specific industrial fields such as manufacturing and processing.

SMTB plans to monitor the status of quantitative target setting regarding the impact of industrial robots, demonstration experiments, contribution to securing the workforce through remote operations using the platform after the launch of the service, and implementation of remote work for hazardous and heavy work.



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Figure 3: Illustration of the solution<sup>3</sup>

#### (b) Robotic assisted surgery system

With a view to applying the technologies it has cultivated through the development of industrial robots to medical robots, KHI established Medicaroid Corporation in 2013 as a joint venture with Sysmex Corporation, which possesses inspection and diagnosis technologies and a broad network in the medical field.

The "hinotori<sup>™</sup> Surgical Robot System," which was developed by leveraging KHI's industrial robotics technologies and Sysmex's medical expertise, became the first domestically produced robotic assisted surgery system to obtain manufacturing and marketing approval in August 2020, and successfully completed its first surgery in December 2020. The features of the system are as follows.

Compactness

The unique design allows for a compact setting of the operating arms, which leads to a large flow line around the surgical table and a larger operating space for the surgeon in the "clean field," resulting in improvement of operability.

Standard features of the Medicaroid Intelligent Network System (MINS) network support system

With a high-speed communication line, it is possible to view the actions of the robot, endoscope screen, and the entire operating room to check whether the robot is operating normally before and during surgery from outside, including from the Medicaroid center and other locations. This brings a high level of safety, including the world's first technology that enables remote support in the event of a problem. The system can improve the efficiency of surgery through data analysis. It can also be used for training junior surgeons by accumulating the surgical data of skilled surgeons and performing numerical analysis of surgical movements.

<sup>3</sup> Source: Materials for the briefing on new company establishment





Figure 4 Medicaroid Intelligent Network System (MINS) <sup>4</sup>

#### > Operability

The operation arms, which consists of eight axes, moves as smoothly as a human arm, reducing interference (collision) between the arms as well as between the arm and the surgeon in the clean field and making it possible to proceed smoothly with the surgical procedure.

Aiming to advance the system even further, Medicaroid is working toward the following goals: (1) improving the accuracy of surgical procedures by injecting fluorescent dye into the surgical field to check the condition of the affected area more precisely; (2) accumulating successful cases of robotic surgeries and first-class technologies from the perspective of engineering; and (3) putting remote surgery via 5G and 6G high-speed communication lines into practice. To promote the use of robotic assisted surgery system, KHI will also prepare flexible introduction measures, such as leasing and performance-based charging usable even by small sized hospitals, as well as focus on expanding the number of applicable medical departments, improving training centers, and fostering proctors (i.e. leader surgeons).

Robotic assisted surgery system is expected to reduce the burden on medical personnel, enable safer surgical procedures, and provide higher quality medical care, as well as shorten hospitalization periods, reduce medical costs, and enable early return to society. In addition, telemedicine is thought to contribute to the correction of disparities in medical care between regions as well as between medical facilities.

<sup>4</sup> Source: OPTiM Corporation website



SMTB plans to monitor the status of quantitative target setting regarding the supply of robotic assisted surgery system, development of new functions and services, and efforts to contribute to the spread of robotic assisted surgery system.



Figure 5 Roles of KHI, Sysmex, and Medicaroid 5

#### (c) Automated PCR testing system

KHI is working to provide a PCR testing system for the diagnosis and treatment of COVID-19 infection. The automated PCR testing robot system, which has been developed and verified for social implementation, consists of a robot system to collect specimens for PCR testing and an automated system to analyze PCR specimens. When collecting specimens for PCR testing, the physician remotely operates the robot, preventing secondary infection. This system was developed by utilizing the technology of Successor, a remote coordination system released by KHI in 2017. In addition, the automated analysis of PCR specimens enables KHI to operate the PCR analysis center for 24 consecutive hours. These systems reduce the risk of infection and workload of medical personnel, as well as prevent human errors and address the shortage of medical personnel, contributing to the expansion of the PCR testing system.

In April 2021, KHI started a project for emergency infection control of COVID-19 in collaboration with Kyoto University Hospital. The project is called Evaluation of the Usefulness of a Large-Scale Fully Automated PCR Robot Container for Social Implementation. The joint research aims to evaluate the performance and clinical effectiveness of the automated PCR testing system developed by KHI, Sysmex, and Medicaroid using KHI's robots, and to evaluate the design of large-scale PCR testing operations, including test requests by the subject or the test management laboratory, test result reporting, and follow-up, and to confirm the usefulness of the PCR testing implemented in the society.

The system consists of a 40-foot container containing a set of five testing processes: (1) centrifugation, (2) opening and dispensing, (3) nucleic acid extraction, (4) reagent preparation, and (5) PCR measurement. Each process is carried out by robots. The system is capable of fully automated testing of up to 2,500 specimens per day, and can quickly perform tests in about 80

<sup>5</sup> Source: Releases by KHI and Medicaroid



minutes once specimens are loaded, at any time. The system can also be compactly laid out in a relocatable container, which helps simplify installation and save space. It enables people to undergo a PCR test on site to obtain a certificate of negative test result in a short time before boarding an airplane or entering an event site.

Based on the validation results of the above joint research, mass testing systems are expected to be prepared promptly for clinical testing for COVID-19, sites where a group infection has occurred, as well as for screening of individuals at high-risk of infection, epidemiological studies, airport quarantine, large-scale events in order to balance infection control and social activities.

KHI's efforts will not only ensure the safety of medical personnel and reduce their workloads through the use of robots to perform tests with infection risk in an unmanned and automated way, but will also contribute to the resumption and recovery of global economic activities that have been stagnant amid the prolonged COVID-19 pandemic. SMTB plans to monitor the status of KHI's provision of the system, expansion and enhancement of PCR testing capacity and system to meet the PCR testing demand, while taking into account the status of quantitative target setting regarding the establishment of PCR testing system, the status of COVID-19 infection, and the trend of PCR testing demand.



Figure 6 Overview of the automated PCR test system<sup>6</sup>

<sup>6</sup> Source: Release by KHI



#### (2) Realization of a near-future mobility society

✓ Increased positive impact
✓ Relevance to the SDGs
3. Good health and well-being, 9. Industry, innovation and infrastructure, 11. Sustainable cities and
communities
✓ Impact category
Health and sanitation, Mobility
✓ Details
Development of a new mobility system contributing to the realization of a Super City, the ideal
form of an advanced city
✓ Action policy
Drive a revolution in the movement of people and goods in Super Cities by creating a business that
integrates VTOL unmanned drones and delivery robots and providing new logistics and human
transportation services.
✓ Goals and Indicators (KPI)
(a) VTOL drones
Goal: Increase in sales of unmanned VTOL drones
Indicator (KPI): Sales of unmanned VTOL drones
(b) Delivery robots
Goal: Increase in sales of delivery robots
Indicator (KPI): Sales of delivery robots

In recent years, KHI has been focusing on the research and development of new solutions that combine the mobility products developed in its motorcycle and engine business with technologies from other businesses. It aims to realize Near-Future Mobility (revolutionizing the movement of people and goods) through the provision of fully automated logistics systems that combine its technologies, such as robots, mobility, and unmanned helicopters.

#### (a)VTOL (Vertical Take-Off and Landing) unmanned drones

Airplanes are mostly used for transporting people and goods over long distances. In the future, however, aircraft and services that can fly automatically over short and medium distances and that can transport people and goods safely and inexpensively will become available. This is expected to contribute to the development of new services and solutions to problems in a number of ways, such as reducing the time required for transportation in urban areas, improving the convenience of transportation in remote islands and mountainous areas, and speeding up medical and goods

transportation at times of disaster. There are more than 50 types of flight systems for VTOLs, as represented by helicopters. Each system has been developed differently depending on flight distances, speeds, takeoffs and landings, applications, and other factors. Mainly because of their ability to land in a limited space and hover in midair, VTOLs are widely used for rescue and emergency services, firefighting and disaster prevention, which are closely related to people's daily lives.

The BK117 helicopter series from KHI is also designed for a range of applications, including the transport of personnel and supplies, rescue, patrol, and emergency medical services, and has been introduced to a number of municipalities and other places. KHI aims to realize a near-future mobility society through the development of VTOL drones, including manned and unmanned helicopters such as the BK117 series, and aircraft operation systems linked to various services.

KHI's VTOL unmanned drone, K-RACER, employs a system of unmanned compound helicopters (a kind of rotary-wing aircraft). In a demonstration test conducted in October 2020, it succeeded in achieving acceleration and stable flight through autonomous control, something that could not have been achieved with conventional technologies. KHI plans to promote the commercialization of VTOL unmanned drones, while addressing issues such as the development of a control system that is crucial for flight under conditions of poor visibility, noise reduction, high-speed flight that contributes to efficient operations, and pilotless autonomous flight at times of emergency and in other situations.

SMTB plans to monitor the status of quantitative target setting regarding VTOL unmanned drones, the progress through the roadmap toward commercialization, and the status of efforts to solve problems, including harmony with the living environment (safety, noise reduction, and emission reduction), improvement of convenience (take-off and landing points, serviceability, all-weather capability, cost, and time), comfort and seamlessness (livability, automated driving, digitalization, and connectivity).



Figure 7 Unmanned compound helicopter, K-RACER<sup>7</sup>

<sup>&</sup>lt;sup>7</sup> Source: Release by KHI



#### (b) Delivery robot

Thanks to robotics and off-road four-wheel vehicle technologies, delivery robots are capable of making deliveries without harm even on rough, bumpy roads.

With excellent mobility, the delivery robot, which combines KHI's robotics technology with the running through performance of off-road four-wheel vehicle, can carefully deliver items even through limited spaces and over stepped surfaces. The robot can run at impressive speeds of 10 km/h in safe areas, and can also follow a marked person to provide support as a carrier. It automatically recognizes and avoids obstacles to ensure safe and automatic driving, and can be easily pushed and lifted by hand if necessary. The robot can additionally be used at hospitals to deliver necessities to hospitalized patients, and at factories to deliver parts and tools. By revolutionizing the movement of people and goods through the use of ultra-lightweight, compact delivery robots that can coexist with people, it is expected to contribute to solving not only shortages of delivery personnel, but also labor shortages in other workplaces.

SMTB plans to monitor the status of quantitative target setting regarding delivery robots, the progress toward commercialization of delivery robots, and the impact created in the fields where they are used.



(3) Realizing a Decarbonized Society by Energy and Environmental Solutions

✓ Increasing the positive impact and reducing the negative impact

✓ Relevance to the SDGs

7. Affordable and clean energy, 9. Industry, innovation and infrastructure, 13. Climate action, 17.

Partnerships for the goals

✓ Impact category

Energy, Climate

✓ Details

Expanding the stable mass supply and use of hydrogen as a clean energy source, and realizing a low-carbon society

✓ Action policy

· Contribute to a decarbonized society through the establishment of a hydrogen supply chain

- · Reducing CO<sub>2</sub> emissions from business activities
- ✓ Goals and Indicators (KPI)
- (a) Transportation amount of hydrogen

Goal: Transportation amount of hydrogen by Kawasaki hydrogen supply chain by 2030: 225,000 tons per year

\*Japan aims to introduce 3 million tons of hydrogen per year.

Indicator (KPI): Transportation amount of hydrogen by Kawasaki hydrogen supply chain

(b) Amount of CO<sub>2</sub> Reduction utilizing hydrogen energy generated by Kawasaki hydrogen supply chain (Theoretical value)

Goal: Amount of CO<sub>2</sub> reduction utilizing hydrogen energy generated by Kawasaki hydrogen supply chain by 2030: 1.6 million tons

Indicator (KPI): Amount of CO<sub>2</sub> reduction utilizing hydrogen energy generated by

Kawasaki hydrogen supply chain

(c) Reduction of CO<sub>2</sub> emissions

Goal: Zero CO<sub>2</sub> emissions in business activities of the Kawasaki Group in 2050 (Scope 1 and 2) Indicators (KPI): CO<sub>2</sub> emissions in business activities of the Kawasaki Group (Scope 1 and 2)

(a) Transportation amount of hydrogen and (b) Amount of CO<sub>2</sub> Reduction utilizing hydrogen energy generated by Kawasaki hydrogen supply chain

KHI is the only company in the world to possess core technologies from upstream to downstream along the hydrogen supply chain (producing, delivering, storing, and consuming). Hydrogen energy through KHI solution refers to hydrogen energy introduced by the hydrogen supply chain in which KHI is involved.



Figure 8 Concept of CO<sub>2</sub>-free hydrogen supply chain<sup>8</sup>

#### Hydrogen Supply Chain

#### Hydrogen production

#### 1. Development of hydrogen production technology

While multiple methods are available for generating hydrogen, KHI is focusing on the production of hydrogen from lignite, an unused resource, and renewable energy sources as a way to produce hydrogen in large quantities at low cost. It is now working to establish these technologies.

#### 2. Development of hydrogen liquefaction system

One form of efficiently storing and transporting large quantities of hydrogen is liquefied hydrogen.

Hydrogen changes from gas to liquid at a cryogenic temperature of minus 253°C, reducing its volume by a factor of 800.

The reduction in volume dramatically improves the efficiency of storage and transportation and enables more hydrogen to be distributed.

Among the many transportation methods, the most efficient means is that in the form of liquefied hydrogen, a technique that is already in practical use.

KHI has developed Japan's first commercial-scale hydrogen liquefaction system with a capacity of approximately 5 tons per day, and successfully achieved the first liquefaction in 2014. It is working on technical reviews to further enlarge the scale and improve the efficiency.

<sup>8</sup> Source: 2nd Study Group on Gas Business Toward 2050, Efforts for Building an International Hydrogen Supply Chain.



#### Hydrogen transportation

#### **Development of Liquefied Hydrogen Carriers**

There are several forms of hydrogen transportation, including high-pressure gas and liquid. High-pressure gas is used to transport relatively small quantities, such as at hydrogen stations for fuel cell vehicles.

While there is an upper limit to the pressure at which hydrogen gas can be safely stored in a compressed state, high-pressure gas can be used at sites showing demand with relatively simple equipment and operation.

In fact, liquid is more suitable for mass transportation. However, the temperature of liquefied hydrogen is lower than LNG (minus 253°C) and requires special equipment and measures for storage and handling, and liquefied hydrogen is rarely transported by sea.

KHI has developed and commercialized transport trailers for high-pressure gas hydrogen for land transportation and transport containers for liquefied hydrogen.

In addition, based on the technologies of LNG carriers and land transportation and the storage of liquefied hydrogen, KHI is developing and building liquefied hydrogen carriers. A trial run between Japan and Australia is being conducted with the aim of commercialization.

#### Hydrogen storage

#### Development of a liquefied hydrogen terminal

A hydrogen supply chain requires a liquefied hydrogen base, where liquefied hydrogen transported from overseas by ship or other means is unloaded and stored, before being supplied to power generation facilities and hydrogen stations.

KHI constructed a pilot-scale cargo handling base in fiscal 2020 to conduct a demonstration test for a liquefied hydrogen storage terminal.

It is also working to develop larger models and international standardization with a view to commercialization.

To store liquefied hydrogen for long periods with low evaporation loss, storage technology enabling it to be stored at minus 253°C is required.

KHI has developed an insulation technology more advanced than that of LNG storage tanks, and is manufacturing high-performance vacuum-insulated liquefied hydrogen storage tanks that

minimize boil-off gas.

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KHI has been engaged in research and development with the aim of establishing a hydrogen supply chain since fiscal 2010. In fiscal 2020, it entered the phase of trial operation.

Since 2016, KHI has formed a technical research association, CO<sub>2</sub> Free Hydrogen Energy Supply-chain Technology Research Association (HySTRA), with Iwatani Corporation, Shell Japan



K.K., and Electric Power Development Co., Ltd. (Marubeni Corporation, ENEOS Corporation, and Kawasaki Kisen Kaisha, Ltd. joined subsequently) With the support of the New Energy and Industrial Technology Development Organization (NEDO) (subsidized project "Demonstration Project for Establishing a Large-Scale Supply Chain for Unused Lignite-Based Hydrogen Transport by Sea"), it has been developing technologies to establish a hydrogen supply chain for the stable and economical procurement of large quantities of hydrogen.

KHI will conduct commercial demonstrations with the aim of commercializing the technology around fiscal 2030. In December 2020, KHI signed a memorandum of understanding with Fortescue Metals Group and Iwatani Corporation, two major iron ore producers, to begin a feasibility study on a "world-leading commercial-scale green hydrogen project" that will produce and liquefy hydrogen from renewable energy sources and import it into Japan. The goal is to demonstrate this project in the mid-2020s. As is widely alleged, the key to the full-scale spread of hydrogen is reducing the cost. In order to lower the cost from 100 yen/Nm3, the current level, to 30 yen/Nm3 in 2030, and subsequently to 20 yen/Nm3, a level that would put in on par with gasoline and LNG, it is necessary to focus on inexpensive manufacturing, supply chain construction, and mass use.

The development of a liquefaction and loading terminal (one 50,000 m3 hydrogen tank) and a liquefied hydrogen carrier (four 40,000 m3 hydrogen tanks), essential technologies for establishing a hydrogen supply chain, is expected to be completed by the end of fiscal 2022. In addition, NEDO's Green Innovation Fund project (total of 2 trillion yen), for which KHI has applied, will be partially allocated for commercial demonstrations with the goal of creating a hydrogen supply chain.

KHI plans to proceed with the current technological development and aims to enter the commercial demonstration phase in 2025 with a supply volume of 28,000 tons/year. It seeks to enter the commercialization stage in 2030 with a supply volume of 225,000 tons/year. It is also expected that the introduction of hydrogen will reduce  $CO_2$  emissions in Japan by 1.6 million tons (theoretical value).



Figure 9: Roadmap for commercialization<sup>9</sup>

<sup>9</sup> Source: Materials for Group Vision 2030 Progress Report Meeting



For the era of hydrogen consumption, it will start operation of a power plant for hydrogen power generation. In the marine field, it has set up a joint venture with Yanmar Power Technology Co., Ltd. and Japan Engine Corporation, and is expected to start demonstrating hydrogen gas engines for ships in 2025. KHI is also participating in the development of hydrogen aircraft (expected sometime after 2035), and plans to lead the integrated development of core technologies for liquid hydrogen fuel tanks, hydrogen fuel supply systems, and hydrogen engines.

With the expectation that hydrogen will be used in a broader array of industries, KHI plans to establish a hydrogen strategy headquarters in its head office division in fiscal 2021 to facilitate company-wide efforts to broaden the scope and expand hydrogen-related business.



Figure 10: Future development of hydrogen-related products and businesses<sup>10</sup>

SMTB plans to monitor the status of commercial demonstrations and efforts toward commercialization at each stage of the supply chain, as well as the status of deployment in various industrial fields.

#### (c) Reduction of CO2 emissions

In 2017, KHI formulated the Kawasaki Global Environmental Vision 2050, a vision of what KHI should be in the future, in which the following three FREEs were set forth: (1)  $CO_2$  FREE: zero  $CO_2$  emissions, (2) Waste FREE: zero waste, and (3) Harm FREE: zero harmful chemicals). With the aim of realizing its long-term environmental vision, KHI has incorporated specific issues to be addressed into its three-year medium-term environmental management plan to promote activities (in accordance with the 10th Environmental Management Activities Plan (FY2019-2021) for fiscal 2021).

 $<sup>^{10}</sup>$  Source: Materials for Group Vision 2030 Progress Report Meeting







Figure 11 Kawasaki Global Environmental Vision 205011

(1) CO <sub>2</sub> FREE	<b>10th Plan Target:</b> Reduce fiscal 2021 CO <sub>2</sub> emissions per unit of net sales by 20% from the fiscal 2013 level (non-consolidated).
Realization of a low-carbon society	<ul> <li>Proactive use of onsite power generation facilities</li> <li>Consider energy supply and demand for each plant and draft concrete plans to adopt onsite power generation facilities. Consider both purchasing such facilities as internal capital expenditure and selling products for such facilities to energy supply companies and then using their power generation services.</li> <li>Utilize renewable energy</li> <li>Purchase electricity from solar power generation facilities on the roofs of our plants</li> <li>Energy-saving activities</li> </ul>
	Promote energy saving by utilizing energy visualization systems and replacing aging equipment Expand the CO <sub>2</sub> -reducing effects of Kawasaki-brand Green Products and other products
(2) Waste FREE	<b>10th Plan Target:</b> Maintain ratio of direct-to-landfill waste to total waste generation at less than 1% (non-consolidated)
Realization of a recycling-oriented society	Further enforce waste sorting and recycling Improve Group-wide management Precisely understand water uses and usage volumes Confirm water resource risks
recycling-oriented	Improve Group-wide management Precisely understand water uses and usage volumes

<sup>11</sup> Source: Kawasaki Environmental Report 2020

<sup>&</sup>lt;sup>12</sup> Source: Kawasaki Environmental Report 2020



KHI is working to reduce  $CO_2$  emissions in its business activities and to expand the benefits of  $CO_2$  emissions reduction through its products to realize a low-carbon society.

Active use of in-house power generation facilities

Depending on the energy demand of each plant, KHI is introducing in-house power generation facilities either through investment in its own facilities or through on-site power generation services after selling products to energy suppliers. It plans to consider introducing in-house power generation facilities using hydrogen fuel, which does not emit CO<sub>2</sub> when used.

Use of renewable energy

KHI has been installing solar power generation facilities at each of its plants, resulting in a total power generation capacity of 4,178 kW, including group companies. In July, the Kobe Head Office switched electricity to that compliant with RE100, which is substantially derived from renewable energy sources.

Energy conservation activities

Each business unit has established its own energy conservation promotion system, and is working on further energy conservation through the use of energy visualization systems and the renewal of aging facilities.

Expansion of CO<sub>2</sub> emission reduction effects through product contributions, including Kawasaki Green Product

More than 90% of  $CO_2$  emitted during the lifecycle of KHI's products is generated during use after the sales process. To realize a low-carbon society, KHI therefore aims to provide products with low  $CO_2$  emissions when used. Aiming to reduce  $CO_2$  emissions when its products are used, KHI is improving the energy use efficiency of products, replacing existing products through electrification and modal shift, and focusing on the growth of products powered by exhaust heat, waste, and renewable energy.

Kawasaki Green Product is an initiative to accelerate the improvement of the environmental performance of products and the reduction of their environmental impact through production processes in order to achieve the Kawasaki Group's mission: "Kawasaki, Working as One for the Good of the Planet". Products that meet KHI's own standards are designated as Kawasaki Green Product or Kawasaki Super Green Product, and are evaluated for conformity.

As a result of calculations based on the flow-based method, which employs the expected life of the product sold as the evaluation period, the reduction in  $CO_2$  emissions from the products sold by KHI in fiscal 2019 is approximately 23.14 million t- $CO_2$ .





Figure 12 Kawasaki Green Product<sup>13</sup>

SMTB intends to monitor the status of reduction of  $CO_2$  emissions in business activities by promoting conversion to clean energy (e.g. use of renewable energy through solar power generation, use of low-carbon energy through LNG in-house power generation facilities that can also combust hydrogen), as well as the contribution to the reduction of  $CO_2$  emissions through the provision of products that significantly reduce  $CO_2$  emissions. KHI aims to achieve zero emissions at its own plants by using hydrogen power generation facilities, and plans to set a  $CO_2$  reduction target toward 2030. For these reasons, SMTB intends to monitor of the status of consideration of target setting and the target levels.

<sup>13</sup> Source: KHI website



#### (4) Waste FREE

Reducing negative impact
Relevance to the SDGs
12. Responsible consumption and production
Impact category
Waste, Resource efficiency/security
Details

Reduction of waste emissions and realization of a recycling-oriented society
Action policy
Reduce the total amount of waste generated and ensure that waste sorting
Goals and Indicators (KPI)
Goal: Ratio of waste disposed of in landfills to total waste generated is less than 1%
Indicator (KPI): Ratio of waste disposed of in landfills to total waste generated

With the aim of realizing a recycling-oriented society, KHI is continuing its efforts to achieve zero landfill waste through the reduction and recycling of waste in its production activities. In the 10th Environmental Management Activities Plan, it has set the goal of reducing the ratio of landfill waste disposal to total waste generated to 1% or less (KHI only), and is working to ensure waste sorting even more thoroughly.

In fiscal 2019, KHI changed product packaging specifications to reduce waste, made improvements to eliminate the need to separate cardboard and foam packaging, and improved the level of management across the Group by consolidating, organizing, and sharing information on the on-site confirmation of legally mandated processing contractors. It is expected that the entire Group, including overseas group companies, will bolster their efforts going forward.



Figure 13 Total amount of waste generated and final disposal rate<sup>14</sup>

<sup>&</sup>lt;sup>14</sup> Source: Kawasaki Environmental Report 2020


In addition, KHI is recycling and properly disposing of waste plastics according to the plastics recycling strategy. In response to the strategy formulated by the Japanese government in 2019 with the basic principle of 3R+Renewable, KHI intends to not only manage waste plastics and but also contribute to solving problems through its business.

For the future plans after 10th Environmental Management Activities Plan, SMTB also intends to review the targets and measures in its medium-term environmental management plan, and monitor the progress.



#### (5) Harm FREE

✓ Reducing negative impact
✓ Relevance to the SDGs
12. Responsible consumption and production
✓ Impact category
Water, Air, Soil
✓ Details
Hazardous chemical substance management
✓ Action policy

Management and operation in accordance with ISO 14001
Ensure that individual chemical substances are stored and handled in accordance with laws and regulations
✓ Goals and Indicators (KPI)
Goal: Reduction of harmful chemical substances
Indicator (KPI): Total amount of harmful chemical substances generated

With the aim of realizing a society coexisting with nature, KHI is taking steps to achieve zero emissions of harmful substances and respect for biodiversity in its business activities. In the 10th Environmental Management Activities Plan, KHI set the goal of "Reduce environmental risk while operating factories with respect for biodiversity," and is working on the appropriate management of harmful chemical substances and consideration of alternatives (reducing environmental risks throughout the Group), identifying tree species at its facilities and replacing them with native species, and continuing company-wide forest conservation activities.

In fiscal 2019, it maintained proper management of dichloromethane, hexavalent chromium, and major VOCs, and examined alternatives, leading to discontinuation of use. Since there is no prospective alternatives that would lead to discontinuation of use, it will continue to study the issue.





Figure 14 Emission and transaction volume of chemical substances under management<sup>15</sup>

For the future plans after 10th Environmental Management Activities Plan, SMTB also intends to review the targets and measures in its medium-term environmental management plan, and monitor the progress, as well as engage in activities, including the setting of quantitative targets that contribute to achieving Harm Free.

 $<sup>^{15}</sup>$ Source: Kawasaki Environmental Report 2020



3-2. Assessment by JCR

Along the criteria to rate PIF listed in the Principles for PIF, JCR examined the impacts based on the KPI of the Finance, so that JCR evaluated the Finance was expected to have variety, magnitude, efficiency, and additionality. Accordingly, JCR assessed the KPI as appropriate indicators in light of the above impact identification, sustainability activities, and impact evaluation.

① Variety: Variety of positive impacts delivered

The Finance is expected to generate positive impacts and reduce negative impacts variously throughout the entire value chain of KHI.

Each of the five impacts indicated by their respective KPI is related to a wide range of impact categories, as shown below.

- (1) Realization of a safe and secure remotely-connected society: Positive impacts on Health and sanitation, and Employment
- (2) Realization of a near-future mobility society: Positive impacts on Health and sanitation, and Mobility
- (3) Realization of a decarbonized society by energy and environmental solutions: Positive and negative impacts on Energy, and Climate
- (4) Waste FREE: Negative impacts on Waste, and Resource efficiency/security
- (5) Harm FREE: Negative impacts on Water, Air, and Soil

From the perspective of the value chain, these include, for example, the use of renewable energy at the procurement stage, energy-saving activities and waste reduction at the manufacturing stage, the enhancement of medical care through surgical support robots and other means, and the construction of the entire hydrogen supply chain at the usage stage.

2 Magnitude: Magnitude of the impacts delivered

The Finance is expected to generate positive impacts and reduce negative impacts significantly. KHI, Ltd. is a leading comprehensive heavy machinery manufacturer with operations in aerospace systems, energy solutions & marine engineering, precision machinery & robot, motorcycle & engine, and rolling stock. As mentioned in the next section, the Group Vision 2030 focuses on three key fields: Safe and Secure Remotely-connected Society, Near-Future Mobility, and Energy and Environmental Solutions. Positive impacts indicated by each KPI are impacts related to these fields. Especially in the area of Energy and Environmental Solutions, KHI, as the only company in the world to possess core technologies from upstream to downstream along the hydrogen supply chain, aims to introduce 225,000 tons of hydrogen in 2030. The target set by the Japanese government is 3 million tons. It is also expected that it will take steps to curb negative impacts, including zero CO<sub>2</sub> emissions in 2050 (Scope 1 and 2).

③ Efficiency: Scale of impacts delivered relative to amount of funds spent

The Finance is expected to efficiently generate positive impacts and reduce negative impacts.



In 2020, KHI formulated its Group Vision 2030, identifying Safe and Secure Remotely-connected Society, Near-Future Mobility, and Energy and Environmental Solutions as its three areas of focus. In 2017, it formulated the Kawasaki Global Environmental Vision 2050, which is based on the pillars of the three FREEs: of CO<sub>2</sub> FREE, Waste FREE, and Harm FREE. To realize this vision, it has developed and implemented a three-year Basic Plan for Environmental Management Activities. In the Materiality, which was reviewed in 2021, the three priority fields in the Group Vision 2030 were identified as "social value created through the business," and the three pillars of the Kawasaki Global Environmental Vision 2050 were identified as elements of "the foundation of our business activities." KHI holds regular meetings of the Sustainability Committee and the Corporate Environment Committee to deliberate and decide on sustainability-related measures and to monitor the status of achievement and compliance, and promotes a number of initiatives in this area.

The impacts indicated by the KPIs of the Finance are related to the three priority fields set forth in the Group Vision 2030 and the three pillars of the Kawasaki Global Environment Vision 2050. It is expected that the Finance will help generate or mitigate these impacts efficiently.

④ Leverage: Degree of leverage of private funds relative to public funds and/or donations Leverage is not to be assessed for the impact indicated by each KPI.

(5) Additionality: Level of additionality

The Finance is expected to have additional impacts on several of the 17 goals and 169 targets of the SDGs, as listed below.

 SDGs Goals and Targets related to the Realization of a Safe and Secure Remotely-connected Society



#### Goal 3: Good health and well-being

**Target 3.8** Achieve universal health coverage (UHC), including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all



#### Goal 8: Decent Work and Economic Growth

**Target 8.2** Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors



#### Goal 9: Industry, Innovation and Infrastructure

**Target 9.5** Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending





#### Goal 17: Partnerships for the Goals

**Target 17.17** Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships

#### (2) SDGs Goals and Targets related to the Realization of a Near-future Mobility Society

#### Goal 3: Good health and well-being



**Target 3.8** Achieve universal health coverage (UHC), including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all



#### **Goal 9: Industry, Innovation and Infrastructure**

- **Target 9.1** Develop quality, reliable, sustainable and resilient infrastructure, including regional and cross-border infrastructure, to support economic development and human wellbeing, with a focus on affordable and equitable access for all
- **Target 9.5** Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending



#### Goal 11: Sustainable Cities and Communities

**Target 11.2** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

(3) SDGs Goals and Targets related to the Realization of a Decarbonized Society by Energy and Environmental Solutions



Goal 7: Affordable and Clean Energy

- Target 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services
- **Target 7.2** By 2030, increase substantially the share of renewable energy in the global energy mix

Target 7.3 By 2030, double the global rate of improvement in energy efficiency

**Target 7.a** By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology





#### Goal 9: Industry, Innovation and Infrastructure

- **Target 9.4** By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities
- **Target 9.5** Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

#### Goal 13: Climate Action



# **Target 13.1** Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries



#### **Goal 17: Partnerships for the Goals**

**Target 17.17** Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships

#### (4) SDGs Goals and Targets related to Waste FREE



#### Goal 12: Responsible consumption and production

- Target 12.2 By 2030, achieve the sustainable management and efficient use of natural resources
- **Target 12.5** By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

#### (5) SDGs Goals and Targets related to Harm FREE



#### Goal 12: Responsible consumption and production

**Target 12.4** By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impact on human health and the environment



#### 4. Assessment of Appropriateness of Monitoring Policies

SMTB will continue to monitor if the intended positive impacts continue to be generated from KHI's business activities and if significant negative impacts continue to be appropriately avoided or mitigated.

KHI discloses qualitative and quantitative information on sustainability in the Kawasaki Report (integrated report), the Kawasaki Environmental Report, the Kawasaki ESG Data Book, and on its website. SMTB can review the disclosed information and other forms of public information to follow up on the status of achievement and other factors. If an event is held, SMTB will seek to hear from KHI about the situation, and conduct engagement on response and other measures as necessary. Therefore, prior to entering into an agreement for the Finance, SMTB requests disclosure of information regarding activities that generate an impact and KPIs in a consistent, regular, and, timely manner, as needed. KHI plans to continue its initiatives to achieve the targets related to the impacts during the contract period. Accordingly, SMTB will monitor the degree of progress.

JCR assessed the above monitoring policy in the Finance as an appropriate way in light of the impact identification and the KPI in the Finance.

#### 5. Assessment of Use of the Model Framework

On the basis of sections 2 through 4 mentioned above, JCR assessed that the holistic impact analysis (impact identification, assessment, and monitoring) of the Model Framework to grasp the three dimensions in relation to SDGs (environmental, social, and economic) is adequately implemented in the Finance.



## **IV.** Compliance with the Principles for PIF

Along the Principles for PIF, JCR examined SMTB's process, methodology, internal regulation, and internal system for PIF arrangement and arranging the PIF for KHI, so that JCR assessed they comply with all the requirements.

Principle	Confirmation result by JCR	
PIF is that which serves to finance Positive	The Finance is positioned as PIF to be provided	
Impact Business.	by SMTB to support KHI's positive impact	
	business.	
PIF is that which serves to deliver a positive	The Finance is expected to identify and mitigate	
contribution to one or more of the three pillars of	negative impacts on the three dimensions of	
sustainable development (economic,	economy, environment and society and produce	
environmental and social), once any potential	positive results.	
negative impacts to any of the pillars have been		
duly identified and mitigated.		
By virtue of this holistic appraisal of	The relationship between the Finance and SDGs	
sustainability issues, PIF constitutes a direct	is clearly indicated, and serves as a solution that	
response to the challenge of financing the SDGs.	can directly contribute to these goals.	
The Principles are intended to be applicable	The Finance is a loan which SMTB provides to	
across all categories of financial instruments and	KHI.	
the business activities that underpin them.		
The Principles for PIF are not sector based.	Regarding the Finance, the overall business	
	activities of KHI have been analyzed.	
The Principles acknowledge the	The Finance focuses on both the positive and	
interconnectedness of sustainability issues and	negative aspects of each impact. A target to	
therefore base themselves on a global	improve the impact has been set for points with a	
assessment of positive and negative impacts	negative aspect, while a target to maximize the	
rather than on the singling-out of sectors.	impact has been set for points with positive	
	aspects.	

#### 1. Principle 1: Definition



# 2. Principle 2: Frameworks

Principle	Confirmation result by JCR
To promote the delivery of PIF, entities	SMTB has developed processes, methods, and
(financial or non financial) need adequate	tools for identifying and monitoring positive
processes, methodologies, and tools, to identify	impacts. It has also established detailed
and monitor the positive impact of the activities,	regulations as operational guidelines, which are
projects, programmes, and/or entities to be	effective in keeping staff informed and
financed or invested in.	maintaining consistency in the assessment. As
	the number of loans increases, however, it is
	expected that more effective PIF can be provided
	in consideration of specific criteria for positive
	impact measures that will serve as a reference to
	make a determination on financing.
Entities should implement specific processes,	SMTB has established processes, criteria and
criteria and methodologies to identify Positive	methods to identify positive impacts in line with
Impact. The analysis should cover activities,	the Model Framework, and included the overall
projects and programmes but also underlying	business activities, including subsidiaries, in the
companies.	analysis.
Entities should apply regular ESG risk	For positive impact analysis, SMTB employs the
management before determining Positive Impact	Impact Radar and Impact Analysis Tool
eligibility.	developed by UNEP FI.
Entities should implement specific processes,	SMTB has established processes, standards and
criteria and methodologies to monitor the	methods for monitoring.
achievement of intended impacts throughout the	
life-time of the financial instrument.	
Entities should allocate and equip staff with	SMTB has departments and personnel with the
relevant mandates and skill sets to enforce the	necessary skills to implement the above process.
above processes.	
Entities should seek second opinions and/or	SMTB has just asked for a second opinion from
third-party assurances on the implementation of	JCR.
the above processes as appropriate.	
Entities should review and update processes as	SMTB occasionally reviews its processes in
appropriate on an on-going basis.	accordance with its internal regulations and
	updates them as necessary. To form the Third
	Party Opinion, JCR has referred to SMTB's
	internal regulations revised in July 2021.



Positive Impact analysis can be undertaken	SMTB uses the Impact Radar and Impact
alongside existing procedures, for instance, at	Analysis Tool developed by UNEP FI, which
on-boarding and during periodical reviews of	specify the criteria for reference and other
products, project or clients. Positive Impact	materials for positive impact analysis.
analysis can make use of existing and recognized	
tools, standards and initiatives where applicable	
(for instance, in the case of project finance, the	
Equator Principles provide a recognised risk	
management standard).	

Principle	Confirmation result by JCR
Entities (financial or non financial) providing	Regarding the Finance, transparency is ensured
PIF should provide transparency and disclosure	through the acquisition and disclosure of the
on:	Third Party Opinion. In addition, KHI will
• The activities, projects, programs, and/or	disclose the points listed as KPIs in the
entities financed considered Positive Impact,	integrated report and on its website. SMTB will
the intended positive impacts thereof (as per	ensure transparency by periodically reviewing
Principle 1);	the status of achievement of the KPIs and
• The processes they have in place to determine	conducting hearings as necessary.
eligibility, and to monitor and to verify impacts	
(as per Principle 2);	
• The impacts achieved by the activities,	
projects, programs, and/or entities financed (as	
per Principle 4).	



### 4. Principle 4 Assessment

Principle	Confirmation result by JCR
The assessment of PIF delivered by entities	SMTB assessed the PIF based on the five
(financial or non financial), should be based on	elements listed in Principle 4 of the Principles
the actual impacts achieved.	for PIF (i.e., (1) variety, (2) magnitude, (3)
	efficiency, (4) leverage, and (5) additionality) to
	provide it. JCR has received sufficient
	information before summarizing the Third Party
	Opinion on the impacts of the Finance.

## V. Conclusion

From the above, JCR confirmed the Finance is suitable for the Principles for PIF and the Model Framework.

Written by Atsuko Kajiwara and Hiroshi Maruyasu



#### Important explanation regarding the Third Party Opinion

1. Assumptions, significance and limitations of JCR's Third Party Opinion

The Third Party Opinion granted and provided by Japan Credit Rating Agency (JCR) is an expression of JCR's current overall opinion on the compliance of the financing entity and the procurement entity with The Principles for Positive Impact Finance (PIF) developed by the United Nations Environment Programme Finance Initiative. It is not a complete indication of the extent of the positive impacts brought by the PIF.

The Third Party Opinion is an expression of opinion on the current plan or situation based on the information provided by the procurement entity and the financing entity who sought a third party opinion, and information collected by JCR independently. It does not provide a guarantee of positive outcomes in the future. In addition, the Third Party Opinion is not a quantitative proof of positive effects of the PIF, and JCR does not assume any responsibility for such effects. JCR confirms that the achievement of the impact indicators in the PIF has been measured quantitatively and qualitatively by the procurement entity or a third party requested by the Procuring Entity, but in principle, JCR does not directly measure it.

2. International initiatives, principles, and the like referred to for summarizing the Third Party Opinion

For summarizing the Third Party Opinion, JCR has referred to the following principles and guidelines developed by the United Nations Environment Programme Finance Initiative.

The Principles for Positive Impact Finance

The Model Framework for Financial Products for Corporates with unspecified use of funds

3. Relationship with activities regarding credit rating business

The act of providing the Third Party Opinion is performed by JCR as a related business and is different from the act of providing credit ratings.

4. Relationship with credit ratings

The assessment of the Finance differs from a credit rating, and does not constitute a commitment to provide or make available for inspection a predetermined credit rating.

5. Third party nature of JCR

There is no capital, personal or other relationships that may cause a conflict of interest between the business entity or procurement entity of the PIF and JCR.

#### ■Notes

The information contained in this document has been obtained by JCR from the business entity or the procurement entity and accurate and reliable sources. However, there may be errors in such information due to human, mechanical or other reasons. Accordingly, JCR makes no representations or warranties, express or implied, as to the accuracy, results, preciseness, timeliness, completeness, marketability or fitness for a particular purpose of such information, and JCR assumes no responsibility for any errors or omissions in such information or for the results of any errors or omissions in such information or for the results of any special, indirect, incidental or consequential damages of any kind, including lost profits or lost opportunities, arising out of any use of such information, whether in contract, tort, negligence or other cause of action, and whether such damages are foreseeable or unforeseeable. The Third Party Opinion is not intended to express any opinion on the various risks (e.g. credit risk, price fluctuation risk, and market liquidity risk) associated with the Positive Impact Finance to be assessed. The Third Party Opinion is an expression of JCR's current comprehensive opinion, not a statement of fact, and does not constitute any recommendation with respect to the judgment of risk or the decision to purchase, sell or hold any individual bonds, commercial paper or other instruments. The Third Party Opinion may be changed, suspended or withdrawn due to changes in, or lack of, information or for any other reason. All rights concerning this document are reserved by JCR. No part of this document may be reproduced, adapted or altered in any way without the prior written permission of JCR.

■Glossary of Terms

Third Party Opinion: This report has been produced from an independent, neutral and impartial standpoint on the conformity of the Positive Impact Finance Assessment prepared by the bank and the like to the Positive Impact Finance Principles of the United Nations Environment Programme Finance Initiative, provided at the request of the client.

Financing entity: A financial institution that provides positive impact finance. Procurement entity: A company or other entity that borrows through positive impact finance for positive impact business.

#### Status of registration as an external evaluator of sustainable finance and the like

- · Member of the Positive Impact Working Group, Financial Initiative, United Nations Environment Programme
- Registered external reviewer of Green Bonds, Ministry of the Environment

• ICMA (registered external reviewer as an observer of the International Capital Markets Association) member of the Social Bond Principles Working Group

Climate Bonds Initiative Approved Verifier

Status of registration as a credit rating agency and the like

Credit Rating Agency, FSA Commissioner (Ratings) No.1

<sup>•</sup> EU Certified Credit Rating Agency

NRSRO: JCR is registered in the following four of the five credit rating classes of NRSROs (Nationally Recognized Statistical Rating Organizations) defined by the U.S. Securities and Exchange Commission. (1) Financial institutions, brokers and dealers; (2) Insurance companies; (3) Corporate issuers; and (4) Issuers of government securities, municipal securities and foreign government securities. If any information is required to be disclosed under Rule 17g-7(a) of the U.S. Securities and Exchange Commission, such disclosure is attached to the news release posted on JCR's website (http://www.jcr.co.jp/en/).



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