

18-D-0867
December 27, 2018

—————JCR Green Loan Evaluation by Japan Credit Rating Agency, Ltd.—————

Japan Credit Rating Agency, Ltd. (JCR) publishes the results of its Green Loan Evaluation as follows.

JCR Assigned Green 1 to Long-term Loan Borrowed by Nippon Yusen Kabushiki Kaisha (NYK)

— with the technical assistance of E&E Solutions—

S u b j e c t : Long-term loan borrowed by NYK
T y p e : Long-term loan
L e n d e r : Taiyo Life Insurance Company
B o r r o w i n g
a m o u n t : JPY 2 billion
Date of the loan
a g r e e m e n t : December 27, 2018
D a t e o f
D i s b u r s e m e n t : December 27, 2018
R e p a y m e n t
d a t e : December 27, 2028
R e p a y m e n t
m e t h o d : Lump-sum repayment on the due date
U s e o f p r o c e e d s : Construction cost of methanol-fueled chemical tankers

<Green Loan Evaluation Results>

Overall evaluation	Green 1
Evaluation of Greenness (use of proceeds)	g1
Evaluation on Management, Operation and Transparency	m1

Chapter 1: Evaluation Overview

NYK is a comprehensive shipping company with one of the world's largest fleets. It was established in 1885 as a result of the merger of Yubin Kisen Mitsubishi and Kyodo Unyu. It has 755 vessels in operation (as of March 31, 2018) and one of the largest businesses in the world, Its strength is in automobile transportation in particular. In 2016, the Company launched two LNG fuel car carriers, for the first time in the world as a shipping company. In 2018, it

issued the world's first green bond in the ocean shipping industry and actively works to deepen its environment-friendly business model by utilizing the proceeds of the funds to invest in LNG fuel tankers, ballast water treatment equipment, and scrubbers.

The subject of evaluation is NYK's long-term borrowings from Taiyo Life Insurance. JCR evaluates whether the borrowings are in line with Green Loan Principles established by Loan Market Association and Asia Pacific Loan Market Association in March 2018.¹

The use of proceeds is expected for the construction cost of methanol-fueled chemical tankers. In addition, ballast water treatment equipment is scheduled to be installed in this chemical tanker. Methanol tankers are expected to reduce SO_x, NO_x, and CO₂ emissions compared to heavy oil-fueled vessels. Ballast water treatment equipment is expected to help prevent cross-border migration and diffusion of aquatic organisms, both of which are expected to have significant environmental effects. Negative environmental effects include increased CO₂ emissions due to electricity consumed by ballast water treatment equipment. However, the contribution rate of the ship as a whole to CO₂ emissions is small, so it is not considered to have a negative impact on environmental improvements. These effects are calculated quantitatively by the NYK Environmental Group and the Engineering Group. Based on the above, JCR evaluates that the Green Project, which will be used for funds, will contribute to the prevention of air pollution, the prevention of climate change, and the conservation of biodiversity.

The proceeds will be managed and checked the allocation status will be reported quarterly to the CFO. The allocation status will be reported to the lender once a year until fully allocated. Based on the above, JCR evaluates that it secures a high level of transparency and effective internal control in the management of proceeds and reporting.

As a result, the long-term loan subject to evaluation was evaluated as "g1" in the "Evaluation of Greenness(Use of Funds)" and "m1" in the "Evaluation on Management, Operation and Transparency" based on the JCR Green Finance Evaluation Methodology. As a result, the "Overall Evaluation" is "Green1." Detailed evaluation results are described in the next chapter. The subject loan also is in line with the Green Loan Principles.

Chapter 2: Current Status of the project on each evaluation factor and JCR's evaluations

Evaluation Phase 1: Evaluation of Greenness

JCR assigns "g1", the highest grade, to "Evaluation phase 1: Evaluation of Greenness".

Rationale: 100% use of proceeds of this borrowing is allocated to green projects, considering the factors described below.

(1) JCR's key consideration

In this section, we first assesses whether the proceeds will be allocated to green projects that have explicit improvement effects on environment. Next, JCR assesses whether an internal department/division which is exclusively in charge of environment issues or a third party agency prove it sufficiently and have taken necessarily workaround or mitigation measures, in case of possibility on use of proceeds have negative impact on the environment. Finally, it confirms consistency with the Sustainable Development Goals (SDGs).

(2) Current status of evaluation targets and JCR's evaluation

¹ LMA (Loan Market Association/Asia Pacific Loan Market Association) JCR

Overview of Use of Proceeds

The outline of the "chemical tanker using methanol as fuel" used for the funds of this loan is as follows.

On-board engine	Dual engine, which uses methanol as the main fuel
Ship-builder	Hyundai Mipo Dockyard Co., Ltd. (Korea)
Completion of construction	2019

"Chemical tankers fueled by methanol" and the ballast water treatment equipment installed have the following social and environmental significance.

- Methanol fuels, which emit less SO_x, NO_x, and CO₂ than conventional fuels, are expected to be widely used from the viewpoint of environmental measures.
- In the future, in promoting energy conversion for the conservation of the marine environment, the methanol fuel vessel can provide useful knowledge in order to consider a wide range of options such as LPG, dimethyl ether, and other low flash-point liquid fuels, and bioethanol, as well as to improve the utilization technology.
- With the movement of ships, the larvae and eggs of animals and phytoplankton, benthic organisms, fish, and other species contained in ballast water may migrate and diffuse into a new environment and disrupt the ecosystem as "alien species" that are not naturally inhabited in that area. This has become a problem in many parts of the world. Ballast water treatment equipment treats marine organisms contained in ballast water, prevents cross-border migration of aquatic organisms affecting the marine environment and contributes to the conservation of biodiversity.

The engine installed on the Vessel is a dual engine, and fuel oil is available in addition to methanol. However, it is mainly used for methanol. It was confirmed through hearing that heavy oil is not used except in emergencies.

There is a possibility that the part of the proceeds will be allocated to refinancing. Even in such cases, the proceeds will be used for refinancing the expenses already paid for the construction of chemical tankers, and will not be applied to other projects. Therefore, even if a part of the funds is used for refinancing, there will be no impact on the environmental improvement effect of the proceeds. It should be noted that although funds for refinancing may arise in cases where delays in project lead to delays in the payment of shipbuilding funds, the JCR confirmed through hearings that NYK has no plan to allocate the proceeds to refinancing, in principle.

a. Environmental improvement effects of the project

i. 100% of the proceeds are used for the construction of chemical tankers using methanol as fuel, which have high environmental performance. This has high positive impact on environment.

The proceeds will be used for constructing methanol-fueled chemical tankers. By switching fuel from heavy oil to methanol, emissions of SO_x, NO_x, and CO₂ are expected to be reduced by 75%, 45%, and 8%, respectively. Although methanol fuels do not contain sulfur, due to the use of heavy oil in pilot fuels and generators, SO_x emissions will be reduced by 75%.

These reductions are calculated quantitatively by the NYK Environmental Group and the Engineering Group. The SO_x reduction rates are calculated from pilot fuel and generator fuel efficiency. The NO_x

reduction rate is calculated based on the main engine's methanol, pilot fuel, and the fuel efficiency of the generator, and the reduction rate is expected to be calculated based on the test results using actual equipment in the future. The reduction rate based on the test results will also be reported to the lender. The rate of reduction of the CO₂ is calculated from the RESOLUTION MEPC.281 (70) issued by the International Maritime Organization and the energy and carbon coefficients per unit weight of heavy oil and methanol shown in the ANNEX 9. Based on the above, the calculation results are considered appropriate.

The MARPOL Convention (International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto) stipulates measures to prevent environmental pollution caused by the navigation of vessels, and regulations on SO_x emissions and greenhouse gas emissions are in place, and the regulatory values are being gradually raised. In the face of increasingly stringent requirements on the environmental aspects of ships internationally, chemical tankers that use methanol as fuel have advanced technologies and are actively responding to these requirements.

In addition, ballast water treatment equipment is scheduled to be installed on the Vessel. Ballast water is seawater used to maintain the balance of ships, usually injected into tanks at the bottom of ships at the port of unloading and drained at the port of loading. The Convention on Ballast Water Management (International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004) was adopted in 2004 and entered into force in September 2017 to prevent the cross-border movement of aquatic organisms by ship ballast water. Based on this convention on ballast water management, discharge of ballast water exceeding the standard value is prohibited, and the installation of ballast water treatment facilities and the formulation of ballast water management plans are required for each ship.

The ballast water treatment equipment to be installed on the Vessel meets international regulatory standards and is operated in accordance with the Ballast Water Management Convention. NYK applies a ship management system that includes control procedures for onboard equipment and ensures compliance with regulations. In addition, NYK Shipmanagement Pte. Ltd., which manages the Vessel, has obtained ISO14001 certification, and the Vessel itself is also scheduled to obtain ISO14001 certification when it is completed. Therefore, it can be said that a management system is in place to maintain environmental improvements in the company of the Vessel.

ii. The funds are used for activities related to the prevention and management of pollution, clean transport, and conservation of terrestrial and aquatic biodiversity among the eligible green project categories under the Green Loan Principles.

The purpose of funding for this project is considered to be the following among the eligible green project categories under the Green Loan Principles: "pollution control and management" which has the effect of reducing SO_x and NO_x; "clean transport" which has the effect of reducing CO₂; and "conservation of terrestrial and aquatic biodiversity" which prevents cross-border migration of aquatic organisms in ballast water.

b. Negative impact on the environment

As a negative effect of this project, the operation of the ballast water treatment equipment may increase power consumption, resulting in an increase in CO₂ emissions. However, it was confirmed from the estimation results that the energy consumption of the ballast water treatment equipment was small compared to the energy consumption of the entire methanol-fueled vessel, and that the contribution rate of the ballast water treatment equipment to the CO₂ emissions of the Ship as a whole was small. In addition, the operation of the ballast water treatment equipment does not generate residues associated with filtration, etc.

NYK started to install ballast water treatment equipment, which was approved by the Ministry of Land, Infrastructure, Transport and Tourism in 2010, ahead of the entry into force of the Ballast Water Management Convention, and has already completed the installation of more than 80 ballast water treatment equipment. Based on these achievements, it is recognized that the management technology of ballast water treatment equipment has been adequately provided.

c. Alignment with SDGs goals and target

Referring to ICMA's SDGs mappings, JCRs evaluates it as contributing to the following SDGs objectives and targets:



Objective 3: Good health and well-being

Target 3.9. By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.



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.



Goal 14: Life below water

Target 14. By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

Evaluation Phase 2: Evaluation on Management, Operation and Transparency

JCR assigns "m1", the highest rating on JCR evaluation Phase 2: Evaluation on Management and Operation and Transparency.

Rationale: These projects have allocated the funding and implemented the business as planner through a firmly equipped management and operation system and high transparency as described below.

1. Appropriateness and Transparency concerning selection standard and processes of the use of proceeds

(1) JCR's key consideration

This section confirms that the objectives to be achieved through the green loan, the criteria for selecting green projects, the appropriateness of the process, and the series of processes are appropriately disclosed to investors.

(2) Current status of evaluation targets and JCR's evaluation

a. Goal

NYK formulated its Environmental Management Vision in 2005. To realize a sustainable society, NYK is pursuing three strategies: (1) reduction of greenhouse gas emissions, (2) promotion of social contribution through global environmental conservation activities, and (3) strengthening of group environmental

management. In addition, as its medium-to long-term environmental targets, the Company has formulated specific CO₂ reduction targets (per unit of transportation) as shown in the chart below, and the Company's policy is to promote initiatives to achieve these targets, including the efficiency improvement of vessel allocation and operation.

FY2015 base year	FY2030	FY2050
Vessel Ocean transportation	-30%	-50%
Ripple effect to the entire supply chain	-40%	-70%

(Source: NYK Medium-Term Management Plan)

The aforementioned reduction targets were certified by Science Based Targets Initiative, an international initiative, in June 2018, as scientifically based targets for achieving the 2°C target of the Paris Agreement. In addition, the above targets are consistent with the GHG reduction strategy adopted by the International Maritime Organization (IMO) in April 2018.

As part of its efforts to achieve the reduction targets, the NYK Super Eco Ship 2050 initiative is aiming to achieve zero emissions by 2050, and has formulated the "Formulating a Vessel Technology/Innovation Road Map" to achieve the targets. This project, the methanol fuel vessel, is positioned as part of the research for future fuel conversion of ships in the road map. In addition, although LNG-fueled vessels have already emerged as alternative fuels to heavy oil, the use of methanol-fueled vessels makes sense as a means of reducing environmental loads, given LNG-fueled vessels' high cost burden and the limited number of ports at which LNG can be replenished.

b. Selection criteria

NYK selects businesses as eligible projects under the Green Loan Principles. This project falls under the categories of "Pollution prevention and control," "Clean transportation," and "Terrestrial and aquatic biodiversity conservation," and the targets have been selected in accordance with the selection criteria.

c. Processes

NYK evaluates and selects projects to be funded through the following process.

- ① NYK's Finance Group interviewed the Planning Group, which manages the entire investment, and the Sales Department, which is in charge of each project, to select candidates for the project.
- ② NYK's Finance Group confirmed with Environmental Group and Engineering Group the validity of projects that were candidates in the process described in (1).
- ③ After JCR, a third-party organization, verified the validity of the above-mentioned project, the final decision was made by NYK,

JCR evaluates that the selection criteria are operated with validity, as the roles of each organization are clearly divided and the decision-making process passes through a department with specialized knowledge.

These selection criteria and the selection and evaluation process will be published in this report to lenders.

2. Appropriateness and Transparency of Management of the proceeds

(1) JCR's key consideration

The management method of the procured funds is usually assumed to be diverse by the borrower. JCR assesses whether the proceeds firmly allocated to the green project, the project have internal systems to easily track the allocation of the proceeds and the money funded by the loan will be allocated to the green project at once. JCR also considers the evaluation of asset management of unallocated money.

It also attaches importance to evaluating the management and operation of the unallocated funds, as well as to confirming that the funds procured from the loan will be allocated to the green projects at an early stage.

(2) Current status of evaluation targets and JCR's evaluation

- a. The full amount of the long-term borrowings subject to the current evaluation will be used for the construction of methanol-fueled chemical tankers. The company plans to fully allocate funds within one year.
- b. As for the method of fund management, NYK's treasurer manages the amount procured and the cumulative amount allocated to the Project in an electronic file. The latter will reach the former to ensure that the funds raised have been used for the project.
- c. The Company's policy is to report the appropriation of funds described above to the CFO on a quarterly basis through the internal reporting system, and to ensure internal control. Reports will be stored permanently on the system.
- d. The undistributed funds will be invested as cash or cash equivalents.

JCR evaluates that fund management is appropriate based on the following considerations: the borrowing will be securely allocated to the Green Project, the proceeds will be managed in an appropriate manner within the company, the internal control system is in place, and there are no particular concerns regarding the management of unappropriated funds.

3. Reporting

(1) JCR's key consideration

This section evaluates whether the disclosure system for investors before and after JCR borrowing is planned in a detailed and effective manner at the time of green loan borrowing.

(2) Current status of evaluation targets and JCR's evaluation

a. Reporting about the proceeds allocations

The Company's policy is to report the amount appropriated for the Project to the lender by e-mail once a year until the completion of allocation. In the event that funds are allocated to refinancing, the amount will be reported together.

b. Impact reporting for environmental benefits

As for the environmental improvement effect, the theoretical values confirmed by the NYK Environmental Group and the Engineering Group will be presented to the lender at the time of loan disbursement. It was confirmed through hearings that the calculation basis (actual emission amount) will be disclosed if requested by the lender. In addition, the Company's policy is to review the theoretical value and report it to the lender if circumstances change significantly and the theoretical value is expected to change significantly.

The Green Loan Principle states that borrowers should make and keep readily available up to date information on the use of proceeds to be renewed annually until fully drawn. Since this project is expected to

be fully allocated to the project within one year of borrowing, there is no particular problem with the reporting that only the theoretical value is disclosed at the time of loan disbursement. Even after completing allocation of funds, NYK Financial Group confirms to the sales division once a year to verify whether or not the environmental improvement effect is maintained internally.

4. Efforts taken by the organization

(1) JCR's key consideration

This section evaluates whether the borrower's management positions environmental issues as a high-priority management issue, and whether the borrower's green loan policy and process, green project selection criteria, etc. are clearly identified through the establishment of specialized environmental departments or through collaboration with external organizations.

(2) Current status of evaluation targets and JCR's evaluation

NYK Sustainability and ESG and ESG-related Initiatives

NYK formulated its Environmental Management Vision and Environmental Policy in 2005. At the working level, NYK is working to realize a sustainable society through the use of its Environmental Management System. In addition to acquiring ISO14001 environmental certification for sites and charters worldwide, the company has established environmental management officers and environmental action committees in Europe, South Asia and Oceania, East Asia, North America, and Japan, enabling it to conduct environmental activities globally. In addition, it has set a medium-to long-term environmental target of reducing CO₂ (70% reduction compared to 2015 by 2050 across the entire supply chain) and formulated the "Formulating a Vessel Technology/Innovation Road Map" to achieve the target. The medium-term management plan has clearly set out a policy of integrating environmental, social, and governance (ESG) elements into management strategies. The Company intends to proactively resolve various social issues through its business activities and to drive the sustainable growth and development of its corporate and social value. In 2010, NYK began installing ballast water treatment equipment on its vessels, and since 2014 it has been conducting R&D on scrubber technology. In this way, NYK has been leading the shipping industry in efforts to improve the environment. In May 2018, the company issued a green bond for the purpose of using LNG fuel carriers and other funds. This is the world's first initiative in the ocean shipping industry. Based on the above, JCR considers NYK to be a company that is actively engaged in sustainability and ESG activities throughout its organization.

As described in Chapter 2.1(2).c, it is also evaluated that departments specializing in the environmental field are clarified, and that project evaluation/selection criteria and selection processes are clarified.

■Assessment result

Based on the JCR Green Finance Evaluation Method, the target long-term borrowings were "g1" in the Green Evaluation (fund use) and "m1" in the Management/Operation System and Transparency Evaluation, and the "Comprehensive Evaluation" was "Green1." This loan is considered to meet the criteria for items in Green Loan Principle and MOE's Green Bond Guidelines.

[JCR Green Finance Evaluation Matrix]

		Management, operation, and transparency assessment				
		m1	m2	m3	m4	m5
Greenness evaluation	g1	Green 1	Green 2	Green 3	Green 4	Green 5
	g2	Green 2	Green 2	Green 3	Green 4	Green 5
	g3	Green 3	Green 3	Green 4	Green 5	Not qualified
	g4	Green 4	Green 4	Green 5	Not qualified	Not qualified
	g5	Green 5	Green 5	Not qualified	Not qualified	Not qualified

■ Evaluation Subject

Borrower: Nippon Yusen Kabushiki Kaisha (Security Code: 9101)

[Assignment]

Type	Amount	Date of Borrowing	Maturity date	Evaluation
Long-term loan	JPY 2 billion	December 27, 2018	December 27, 2028	JCR Green Loan Evaluation: Green 1 Green evaluation : g1 Management, operation, and transparency assessment : m1

GB Analysts in charge of this Evaluation: Atsuko Kajiwara and Akihiro Kondo

Important explanation of the Green Loan Evaluation

1. Assumptions, Significance, and Limitations of JCR Green Evaluation

JCR Green Loan Evaluation, which is granted and provided by the Japan Credit Rating Agency (JCR), is a comprehensive expression of JCR's current opinion on the extent to which the funds procured green loans, which are subject to evaluation, are allocated to green projects defined by JCR and the extent to which the management, operation, and transparency of the use of green loans are ensured. The JCR Green Loan Evaluation does not fully indicate the extent to which the funds procured from such green loans are allocated and the management, operation, and transparency of the use of the funds are ensured.

JCR Green Loan Evaluation evaluates the appropriation of funds at the time of the Green Loan program or at the time of the loan execution. It does not guarantee the appropriation of funds in the future. In addition, the JCR Green Loan Evaluation does not prove the environmental effects of green loans and is not responsible for their environmental effects. JCR confirms that the effects of the funds procured green loans on the environment are measured quantitatively and qualitatively by the borrower or by a third party requested by the borrower, but in principle it does not directly measure the effects.

2. Methods used in the conduct of this evaluation

The methods used in this evaluation are listed on the JCR website (Green Finance ESG in <https://www.jcr.co.jp/greenfinance>) as the JCR Green Finance Evaluation Method.

3. Relationship with Acts Related to Credit Rating Business

The JCR Green Loan Evaluation is determined and provided by JCR as a related business, which is different from the activities related to the credit rating business.

4. Relationship with Credit Ratings

The Assessment differs from the Credit Rating and does not promise to provide or make available for inspection a predetermined Credit Rating.

5. Third-Party Evaluation of JCR's Green Finance

There are no equity or personnel relationships between the evaluator and JCR that may create conflicts of interest.

6. Technical Cooperation from E&E Solutions

We invited environmental experts from our business partner E&E Solutions to verify the environmental improvement effects of this evaluation.

■Disclaimers

The information contained in this document has been obtained by JCR from the Borrower and from accurate and reliable sources. However, that such information may be erroneous due to human, mechanical or other reasons. Accordingly, JCR makes no representation or warranty, express or implied, as to the accuracy, results, accuracy, timeliness, completeness, marketability, or fitness for a particular purpose of such information, and JCR assumes no responsibility for any error, omission, or result of using such information. In no event shall JCR be liable for any special, indirect, incidental or consequential damages of any kind, including opportunity loss, monetary loss, which may arise from any use of such information, whether contractual, tort, negligence or other cause of liability, and whether or not such damages are foreseeable or unforeseeable. The JCR Green Loan Evaluation does not express any opinion on the various risks (credit risk, price fluctuation risk, market liquidity risk, price fluctuation risk, etc.) associated with the green loan subject to the evaluation. The JCR Green Loan Evaluation is a comprehensive statement of opinion at the present time of the JCR and is not a statement of fact and does not make any recommendations regarding risk judgment or the decision to purchase, sell or hold individual bonds, commercial paper, etc. JCR Green Loan Evaluations may be changed, suspended, or withdrawn due to changes in information, lack of information, or other reasons. All rights to this document, including data from the JCR Green Loan Assessment, are held by JCR. Reproduction, adaptation, modification or alteration of this document, in whole or in part, including data from the JCR Green Loan Assessment, without the permission of JCR is prohibited.

■Glossary

JCR Green Loan Evaluation: The JCR Green Loan Evaluation evaluates the extent to which the funds procured from the Green Loan are allocated to the Green Project as defined by JCR, and the extent to which the management, operation, and transparency of the Green Loan are ensured. Evaluations are graded on a scale of 5, beginning with the top, using the Green1, Green2, Green3, Green4, and Green5 symbols.

■Status of registration as an external assessor of green finance

- Registration of Green Bond Issuance Supporters by the Ministry of the Environment
- ICMA (Registered as an observer of the International Capital Markets Association)

■Status of registration as a credit rating agency, etc.

- Credit Rating Agency: the Commissioner of the Financial Services Agency (Rating) No.1
- EU Certified Credit Rating Agency
- NRSRO: JCR has registered with the following four of the five credit rating classes of the Securities and Exchange Commission's NRSRO(Nationally Recognized Statistical Rating Organization). (1)Financial institutions, broker dealers, (2) insurance companies, (3) general business corporations, and (4) government and local governments. If the disclosure is subject to Section 17g-7(a) of the Securities and Exchange Commission Rule, such disclosure is attached to the news releases posted on the JCR website (<https://www.jcr.co.jp/en/>).

■For further information, contact

Information Service Dept. TEL: :03-3544-7013 FA FAX: :03-3544-7026

Japan Credit Rating Agency, Ltd.

Jiji Press Building, 5-15-8 Ginza, Chuo-ku, Tokyo 104-0061, Japan
Tel. +81 3 3544 7013, Fax. +81 3 3544 7026

Copyright © Japan Credit Rating Agency, Ltd. All rights reserved.