

Assurance Statement JFE Steel Corporation

NIPPON KAIJI KYOKAI (ClassNK) has conducted a conformity assessment (validation and verification, mixed engagement) of JFE Steel Corporation's (JFE Steel) "Green Steel Products (JGreeX) Calculation Report" (rev. 1) for fiscal year 2022 (April 1st 2022 to March 31st 2023). The calculation report estimates emission reductions and a partial carbon footprint for fiscal year 2022. The conformity assessment was requested by JFE Steel.

Scope of JFE's steel works:

- Verification of emission reductions: West Japan Works (Kurashiki area and Fukuyama area)
- Partial carbon footprint verification: West Japan Works (Kurashiki area and Fukuyama area) and Chita Works

Applicable standards and references (latest versions at the time of issuance of the statement)

- 1) ISO 14064-1 Greenhouse gases - Part 1
- 2) ISO 14064-2 Greenhouse gases - Part 2
- 3) ISO 14404-1 Calculation method of carbon dioxide emission intensity-Part 1
- 4) GHG Protocol
- 5) ISO 14040 Environmental management - Life cycle assessment - Principles and framework
- 6) ISO 14044 Environmental management - Life cycle assessment - Requirements and guidelines
- 7) ISO 14067 Greenhouse gases - Carbon footprint of products
- 8) ISO 20915 Life cycle inventory calculation methodology for steel products
- 9) ISO 22095 Chain of Custody – General terminology and models
- 10) JFE Steel Internal Standards ("Internal standard for managing system of CO₂ emissions," "Internal standard for calculating CO₂ emissions," "Internal standard for CO₂ reduction projects," "Internal standard and procedure for order management of "JGreeX")
- 11) The Japan Iron and Steel Federation's "Guidance for calculation of CO₂ emission intensity for green steel using the mass balance method" (provisional guidelines)
- 12) ISO 14064-3 Greenhouse gases - Part 3
- 13) ISO 17029 Conformity assessment - General principles and requirements for validation and verification bodies
- 14) ISO/IEC 17065 Conformity assessment - Requirements for bodies certifying products, processes and services

Level of Assurance and materiality:

Limited assurance (Materiality as the professional judgement of the verifier)

Summary of verification

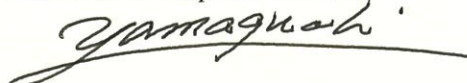
- GHG reduction method: Expanded use of cold iron sources
- Verified in-house CO₂ emission reductions 520,000 tCO₂ in FY2022
- GHG intensity: Scopes of calculation were the GHG protocol-defined Scope 1 & Scope 2 emissions
- GHG types: CO₂ only

Statement of opinion:

Unmodified Opinion: Nothing has come to the attention of ClassNK during its review of JFE Steel's calculation report that would cause it to believe that the report has not conformed to the standards and references listed above.

Based on its evaluation of JFE Steel Internal Standards, ClassNK found that JFE Steel has an order management system for the production and sale of "JGreeX" products under such standards.

September 12, 2023
NIPPON KAIJI KYOKAI
Innovation Development Division



Yoshiya Yamaguchi, Director

Assurance Statement JFE Steel Corporation

General contents of the conformity assessment:

This assurance statement is issued for JFE Steel Corporation.

NIPPON KAIJI KYOKAI (ClassNK) has conducted a conformity assessment (validation and verification, mixed engagement) of JFE Steel Corporation's (JFE Steel) "Green Steel Products (JGreeX) Calculation Report" (rev. 1) for fiscal year 2022 (April 1st 2022 to March 31st 2023). The calculation report estimates emission reductions and a partial carbon footprint for fiscal year 2022. The conformity assessment was requested by JFE Steel.

JFE Steel's calculation report estimates direct (Scope 1) emissions and indirect (Scope 2) emissions from energy sources. Only CO₂ emissions are quantified.

The conformity assessment covered emission reductions and partial carbon footprints in the below JFE's steel works.

- Verification of emission reductions: West Japan Works (Kurashiki area and Fukuyama area)
- Partial carbon footprint verification: West Japan Works (Kurashiki area and Fukuyama area) and Chita Works

The quantification of the partial carbon footprint conforms to the following methods:

- Outline of lifecycle stages: All production processes in JFE Steel's facilities (not including the raw material stage and other stages)
- Product Category Rule (PCR): Compliant with the PCR prepared for JGreeX claims
- Functional unit: 1 ton of product
- Cut-off threshold: Not applicable

Applicable standards and references (latest versions at the time of issuance of the statement)

- 1) ISO 14064-1 Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
- 2) ISO 14064-2 Greenhouse gases - Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements
- 3) ISO 14404-1 Calculation method of carbon dioxide emission intensity from iron and steel production – Part1: Steel plant with blast furnace
- 4) GHG Protocol
- 5) ISO 14040 Environmental management - Life cycle assessment - Principles and framework
- 6) ISO 14044 Environmental management - Life cycle assessment - Requirements and guidelines
- 7) ISO 14067 Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification
- 8) ISO 20915 Life cycle inventory calculation methodology for steel products
- 9) ISO 22095 Chain of Custody – General terminology and models
- 10) JFE Steel Internal Standards ("Internal standard for managing system of CO₂ emissions," "Internal standard for calculating CO₂ emissions," "Internal standard for CO₂ reduction projects," "Internal standard and procedure for order management of "JGreeX")
- 11) The Japan Iron and Steel Federation's "Guidance for calculation of CO₂ emission intensity for green steel using the mass balance method"
- 12) ISO 14064-3 Greenhouse gases - Part 3 - Specification with guidance for the verification of greenhouse gas statements
- 13) ISO 17029 Conformity assessment - General principles and requirements for validation and verification bodies
- 14) ISO/IEC 17065 Conformity assessment - Requirements for bodies certifying products, processes and services

Responsibility for the management of GHG data:

JFE Steel is responsible for preparing the calculation report and for maintaining effective internal controls over the data and information disclosed. ClassNK is responsible for carrying out the conformity assessment for the calculation report in accordance with the contract made with JFE Steel. The calculation report and related GHG emission and reduction data receive final approval from JFE Steel and will continue to remain under its responsibility.

Procedures for conformity assessment (assurance engagement):

The conformity assessment referred to the following procedures:

- ISO14064-1:2018 Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
- ISO 14064-2:2019 Greenhouse gases - Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements

- ISO 14404-1:2013 Calculation method of carbon dioxide emission intensity from iron and steel production - Part1: Steel plant with blast furnace
 - ISO 14067:2018 Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification
- In order to issue a limited assurance for the GHG statement written in the report, the conformity assessment followed:
- ISO14064-3:2019 Greenhouse gases - Part 3: Specification with guidance for the verification and validation of greenhouse gas statements
 - The conformity assessment also referred to “Guidance for calculation of CO₂ emission intensity for green steel using the mass balance method” published by The Japan Iron and Steel Federation.

The annexes to the “Law Concerning the Promotion of the Measures to Cope with Global Warming” and the standard calorific values and carbon emission factors (comprehensive energy statistics) published by the Ministry of Economy, Trade and Industry were adopted as the “quantitative methods” required by ISO14064-1. Only the monitoring and calculation-related parts of them were applied.

Lastly, a review of JFE Steel’s various GHG-related rules concluded that the production of JGreeX was correct.

In order to reach a conclusion, the verification component of this assessment carried out a sampling that included the following activities:

- Site visit to West Japan Works Kurashiki area.
- Interview of the staff in charge of GHG emission data, information management, and report creation at the above site.
- Review of the procedures for information management, GHG emission data, and production data included in the calculation report
- Verification of the consistency between the GHG and production data and information included in the calculation report, and the available information sources and data aggregated in the head office
- Review of blast furnace and converter structures and emission source data
- Review of GHG emission data’s QA/QC system, and the system for double-checking during record taking

Verification of in-house CO₂ emission reductions:

JFE Steel intends on increasing the amount of CO₂ emissions reduced by expanding the use of low-emission cold iron sources. There are no methods for estimating emission reductions from the use of this technique. Therefore, it is required to directly measure usage of cold iron sources and consequent emission reductions, as it is not acceptable to estimate emission reductions based on default reduction factors achieved by recycled scrap.

JFE Steel launched its emission reduction project in FY2020. The baseline against which project performance is compared is the 5-year average rate of use of cold-iron over the period beginning in FY2015 and ending in FY2019. The baseline CO₂ intensity is set for FY2019, and in-house CO₂ emission reductions are calculated for JFE Steel West Japan Works (locations in Kurashiki and Fukuyama).

The amount of steel products to which the JGreeX designation is assigned is in proportion to the amount of CO₂ emissions reduced. After carrying out strategic and risk analyses, ClassNK collected energy bills and various energy data at the above two sites and reached its conclusion based on them.

For sites that implemented reduction projects, the reduction results of such projects are reflected in the partial carbon footprint values of the sites. The partial CFP value is corrected for the reduction effect so that the reduction effect is not double-counted when producing JGreeX, and the amount of JGreeX that can be produced is calculated accordingly.

Level of assurance and materiality:

The opinion expressed in this statement is formed based on a limited level of assurance, and materiality is set as the professional judgement of the verifier.

Statement of opinion:

Unmodified Opinion: The above conformity assessment procedures provide a reasonable basis for the expression of an unqualified opinion. The in-house CO₂ emission reductions and CO₂ intensity value shown in the annex table below were estimated in accordance with the above-mentioned standards. Nothing has come to the attention of ClassNK that would cause it to believe that they were not estimated according to them.

Based on its evaluation of the JFE Steel Internal standard and procedure for order management of “JGreeX”, ClassNK found that JFE Steel has a management system in place for producing JGreeX and is able to sell the product under such standards. The verified CO₂ emission reductions can be allocated to any steel product offered for sale.

Recommendations for improvement:

- 1) This conformity assessment did not cover the delivery of certified JGreeX products to final consumers. In order to increase the consumers' trust in JGreeX, it is recommended to implement JGreeX labelling and Chain-of-Custody verification (confirming transfer of ownership).
- 2) A characteristic of the JFE Steel's emissions inventory is that emissions from coal and coke account for more than 90% of the total. It is recommended to evaluate the uncertainty in the emissions and emission reduction values and based on this evaluation to conservatively calculate JGreeX production.
- 3) The partial carbon footprint covered only JFE Steel's in-house production processes and CO₂. It is recommended to include further steps in the production process such as the extraction and procurement of raw materials and to account for all GHG gases so as to be in strict compliance with ISO14067. This expansion of the scope of partial carbon footprint is time consuming and it is therefore recommended to create a plan for it.

September 12, 2023

NIPPON KAIJI KYOKAI
Certification Department



Takashi Kawamoto, Lead Verifier:

Annex table: **Summary of verification**

- GHG reduction method: Expanded use of cold iron sources
- Verified in-house CO₂ emission reductions 520,000 tCO₂ in FY2022
- GHG intensity: Scopes of calculation were the GHG protocol-defined Scope 1 & Scope 2* categories
- GHG types: CO₂ only

The conformity assessment covered the overall calculation system of JFE Steel. However, the assessment does not guarantee its correctness.

* Note: GHG protocol's scopes 1, 2 & 3:

ISO14064-1 2018 requires GHG emissions at the organization level to be aggregated by the categories listed below from a. to f. However, JFE Steel's "Green Steel Products (JGreeX) Calculation Report" (rev. 1) calculates and declares emissions following the GHG protocol's concept of "scopes" (scope 1, scope 2 and scope 3). The conformity assessment evaluated JFE Steel's GHG claims according to the GHG protocol concept.

- a. Direct GHG emissions and removals
- b. Indirect GHG emissions from imported energy
- c. Indirect GHG emissions from transportation
- d. Indirect GHG emissions from products used by an organization
- e. Indirect GHG emissions associated with the use of products from the organization
- f. Indirect GHG emissions from other sources