

Green steel applying mass balance approach

26th October 2023

The Japan Iron and Steel Federation

What is green steel applying the mass balance approach?

This is a method in which steel manufacturing companies issue reduction certificates by GHG or CO₂ emissions reductions from “projects” with additionality (actual emission reductions) that they have planned, incurred additional costs, and committed to, and supply steel products with the reduction certificates. Customers who purchase green steel with the mass balance approach applied can reduce their own Scope 3 emissions.

The steel industry emits a large amount of carbon dioxide from the steel manufacturing process and it is a typical example of a hard-to-abate industry in the context of climate change. Nevertheless, there is a growing need for steel supply with reduced emissions from a wide range of domestic and international customers, because steel is used in a various applications and is indispensable to modern society. During the long and difficult decarbonization transition period of the steel industry, the mass balance approach is an important solution to exchange emissions reductions with economic value, enabling priority supply of green steel to customers who appreciate the value of the reductions.

When providing green steel by applying the mass balance approach, emissions and emissions reductions are calculated complying with and referring to ISO standards. In addition, third-party certification ensures transparency and prevents double-counting of emission reductions.

Overview of Steel Mass Balance Approach

This method consists of three steps.

1. Calculate the GHG emissions intensity of the specific steel products applying this approach
2. Identify GHG emission reduction projects and determine their GHG emission reduction amounts
3. Issue reduction certificates not to exceed the total GHG emission reduction amounts. Supply steel products with reduction certificates.

All steps must be verified by third-party certification.

Step 1: Calculation of GHG emissions intensity for steel products

- ✓ This calculation complies with ISO 20915:2018 (Life cycle inventory calculation methodology for steel products standard) or JIS Q 20915.
- ✓ GHG emissions intensity calculated for EPD or that specially calculated for this purpose are used, but both are values from which the reduction effect of the project has been excluded. CO₂ emissions intensity may also be used as emissions intensity too.
- ✓ Actual data is used in this calculation, with primary data used within 5 years from the year of calculation and secondary data used within 10 years from the year of calculation. Data that excludes the impact of reduction projects may also be used.

Step 2: Calculation of GHG emission reductions

- ✓ This calculation complies with ISO 14064 (Greenhouse gases standard).
- ✓ Calculate the total amount of GHG (or CO₂) emissions reductions in a given period after the project is applied, compared to the baseline i.e. before the project was applied.
- ✓ It is required that the emissions reduction project secures "additionality" that an organization (a steel manufacturing company) has planned, incurred additional costs, and committed to on its own.
- ✓ GHG (or CO₂) emissions reductions are calculated and managed as resources for the reduction certificates to be issued in Step 3.
- ✓ Project eligibility will be examined each time the emission reductions are verified, and if the project no longer meets requirements as "project", the application to this project will be terminated.

Step 3: Supply of steel products with reduction certificates

- ✓ This step refers to the mass balance model in ISO 22095:2020 Chain of custody.
- ✓ GHG (or CO₂) emissions reductions from the project are stored in an account of the organization separately from the manufacturing process, and the emissions reductions are attributed to any product, and the product is supplied with the emissions reduction certificate.
- ✓ Because the GHG (or CO₂) emissions reductions are calculated within the organization, the reduction can be attributed to any steel product manufactured within the same organization, regardless of which site the product was manufactured at.
- ✓ "GHG intensity (carbon footprint) of steel products (e.g. EPD)" and "GHG emission reductions available to the customer" are clearly separated and presented to the customers. The reduction certificates will not be distributed in the market on their own.
- ✓ A customer who purchases a product with an emissions reduction certificate can reduce their Scope 3 emissions in accordance with the certificate.
- ✓ Double counting of emission reduction effect will be appropriately prevented. For example, when GHG emission intensity in EPD is used in Step 1, the emission intensity will include the effect of the reduction project when the EPD is recalculated after the application of this mass balance approach. For example, if a customer purchases a product without a reduction certificate and calculates Scope 3 emissions with the product, we will clearly inform the customer that the GHG intensity in the EPD cannot be used and will disclose an appropriate GHG intensity for the Scope 3 calculation.