Circulation of Steel Resources in 2030

Compiled by the Tokyo Steel Scrap Research Team

(1) Low-CO2 electric furnaces are trending thanks to the utilization of urban mines.

Japan has a long history of having the world's largest steel production capacity, and has what are called "urban mines," or steel stock of 1.4 billion tons. As a result of this accumulation, a large amount of scrap that the country should be proud of before the world is produced every day. Electric furnace iron, which is produced from the scrap using electricity, only emits 1/5 of CO2 compared to blast furnace iron, which is produced using imported iron ore. Therefore, in Japan, which is aiming to become carbon neutral, the electric furnace process is truly the method of making iron that matches the times, and increasing the proportion of electric furnace iron is directly linked to the benefits of the country as a whole. Blast furnace manufacturers' plans to convert their blast furnaces to electric furnaces and the government's expressed support for the project are proof of such a trend.

(2) We must present a "professional" analysis! Pioneer mission.

Tokyo Steel is the largest electric furnace manufacturer in Japan, and since its foundation, it has been working on scrap for more than 90 years to improve its utilization technology. Therefore, we are proud that we have unique knowledge, experience, and know-how about scrap that are not available in research institutes such as universities, think tanks, government agencies, and blast furnace manufacturers. We have recently launched an in-house Scrap Research Team to analyze the future of scrap supply and demand.

This was triggered by the spread of pessimistic views on the future supply and demand of scrap in recent years. More specifically, more than a few research institutes commented, "The amount of scrap generated in Japan (44 million tons) is only about half of the amount of crude steel produced (87 million tons)." In response, even industry associations, and ministries and agencies are stressing scrap shortages, saying that the "future expansion of electric furnaces will be limited from the viewpoint of scrap procurement." However, the domestic demand for steel raises the suspicion that this is a one-sided view. This is because domestic demand for steel in fiscal 2023 was 54 million tons, while the amount of scrap generated was 44 million tons. Although a simple comparison cannot be made, the amount of scrap generated in Japan is as high as 81% of the domestic demand for steel.

(3) What we should look at is the circular steel ratio.

Therefore, we decided to examine in detail whether there is a sufficient supply of scrap to meet the demand for scrap, taking into account the types of scrap, when scrap is not exported (about 7 million tons are actually exported every year); that is, when scrap generated in Japan is fully utilized. Specifically, we estimated the supply and demand of scrap, the electric furnace domestic demand ratio, and the circular steel ratio (CSR) in detail, taking advantage of our expertise in both aspects: what kind of scrap is needed for each type of steel material; what kind of scrap is generated daily in Japan. The CSR is a concept uniquely defined by Tokyo Steel and represents the percentage of steel products produced domestically that are derived from domestic steel scrap.

(4) Now is the time to emphasize “usable electric furnaces.”

As a result, it was found that the CSR was 67.2%. This means that 67.2% of steel products in Japan can be made from domestically generated scrap iron. Considering that the CSR in the United States is about 60-70%, it is clear that the CSR in Japan and the potential of electric furnaces is high.

The fact that electric furnaces can cover much of Japan’s domestic demand for steel products means that they can prevent the outflow of precious iron resources and reduce dependence on foreign sources. Moreover, further utilization of electric furnaces is also significant for decarbonization in Japan. We sincerely hope that the government, which is the owner of the largest steel accumulation due to the accumulated public works, will take some action to realize the vision presented in this report in an effort to expand the demand for circular steel materials.

Some local governments have already introduced systems to create demand for recyclable materials ahead of the national government. For example, if limited to steel materials, the Tokyo Metropolitan Government has introduced a system to report the input of recycled steel materials such as electric furnace steel in the Tokyo Metropolitan Government Environmental Products Procurement Policy.

However, it is felt that the national government has not clearly set out a mechanism to promote steel recycling. In the Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities, which was revised in April 2025, steel is positioned for the first time as a common standard of judgment in the procurement of environmental goods, etc. However, it is very regrettable that the act does not specify electric furnace steel materials, which are produced from scrap as the main raw material, in order to promote resource recycling. It is hoped that the government authorities, which have “owned” iron in the form of buildings and infrastructure through past public investments, will take the lead in promoting the effective use of urban mines by announcing a policy on actively using circular steel in public projects and procurement.

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