Development of Steel Products Inventory Database from Statistics and PRTR Data in Japan

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Transparent and reliable inventory data are prerequisites for performing lifecycle assessment (LCA), and the current life cycle inventory (LCI) data are not sufficient for precise analysis because they cover limited environmental pollutants. Through Pollutant Release and Transfer Register (PRTR, a.k.a. TRI in the United States) that took effect in 1999 in Japan, information on released amounts of environmental pollutants has become open to public. PRTR has a significant potential in developing accurate inventory data once embedded in process data. However, the data obtained from PRTR cover the emissions of PRTR targeted substances from business, and defining the emission process and route for production of each material is critical for the data to be applicable to LCA.

In this study, we utilized statistics to develop the process inventory data for steel products, covering pig iron, ferro-alloy, crude steel and various rolled steel products. While in this effort, we made distinctions between converter steel from iron ore and electric furnace steel from scrap for crude steel and rolled products. Also, we developed transparent inventory data for various coated steel sheets, tool steel, bearing steel, alloy steel and stainless steels, that are products for specific use, based on their typical composition and production process. We further embedded the emission data of the steel industry's PRTR target pollutants in the developed inventory database. The above method allowed us to successfully develop inventory database for the production of Japan's steel products.