

# III

# Supply and Demand for Iron and Steel Slag

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### Outline of the Supply and Demand for Iron and Steel Slag

In recent years, the annual production of iron and steel slag has been around 35 million tons, and the cumulative external sales volume over the past 40 years has reached approximately 1.25 billion tons. The production of iron and steel slag is linked to steel production. In addition to the slowdown of the global economy since the second half of 2019, the impact of the COVID-19 pandemic in 2020 caused a sharp decline in steel production, resulting in a significant reduction in iron and steel slag production as well. Since then, with the recovery of economic activities, steel production has shown a gradual recovery trend, and as a result, iron and steel slag production has been on an upward trajectory.

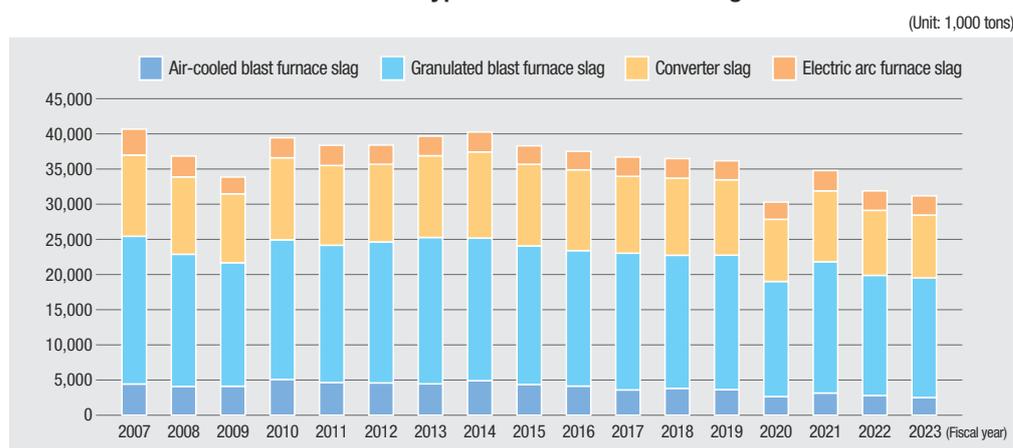
During the period of rapid economic growth, large quantities of iron and steel slag were used as construction materials in civil engineering projects related to steelworks. Additionally, its use as a base course material for general roads also began during this time. Ever since the second oil crisis, iron and steel slag have been used in a variety of products for a wide range of applications, responding to the needs for resource and energy savings as well as environmental preservation. For example, iron and steel slag aggregate is expected to serve as an alternative material to natural aggregate due to the reduction in natural materials as a result of the regulation of sea sand extraction in the Seto Inland Sea and other regulations. Taking advantage of the fact that steelmaking slag has a larger angle of shear resistance than natural sand, a seabed improvement method using steelmaking slag as a material for sand compaction piles has been developed, and a wealth of construction experience has been accumulated. Highly evaluated for

its energy-saving effect, which reduces production energy in the calcination process of cement production by 40% or more, and for its CO<sub>2</sub> emission reduction effect, blast-furnace slag cement, consisting of a mixture of ground granulated blast furnace slag and Portland cement, was selected as a designated procurement item under the Act on Promoting Green Procurement in 2001. The expanded use of mixed cements, which includes blast-furnace slag cement, has been incorporated as part of the greenhouse gas reduction target for FY 2030 (a 46.0% reduction compared to FY 2013). Furthermore, many types of blast-furnace slag cement with an increased ratio of blast furnace slag in the cement have recently been proposed to help reduce carbonization.

Additionally, in response to the increasing demand for cement raw materials abroad, the export of granulated slag for cement use has also expanded.

In recent years, steelmaking slag has been recognized as a soil-conditioning fertilizer because it contains micronutrients required by crops, including alkali content, silica (SiO<sub>2</sub>), magnesia (MgO), phosphorus (P<sub>2</sub>O<sub>5</sub>), iron, and manganese (MnO). Furthermore, research has shown that these mineral components are effective in restoring marine environments, and steelmaking slag is expected to see increased demand as an environmental material.

Trends in the Production of Various Types of Iron and Steel Slag

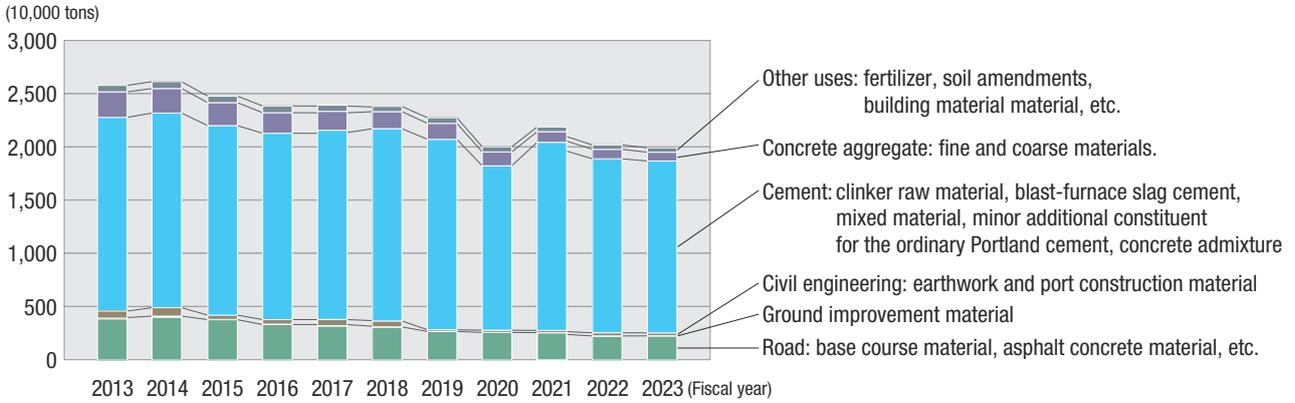


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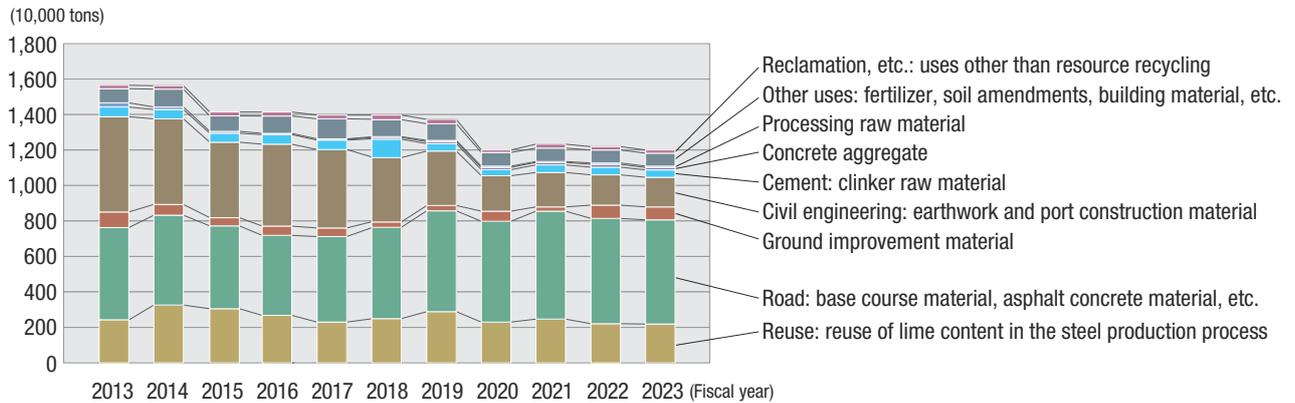
Data Collection

Trends in the Use of Blast Furnace Slag and Steelmaking Slag by Usage Breakdown

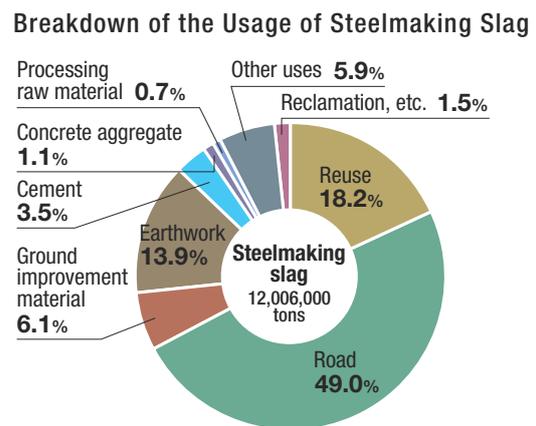
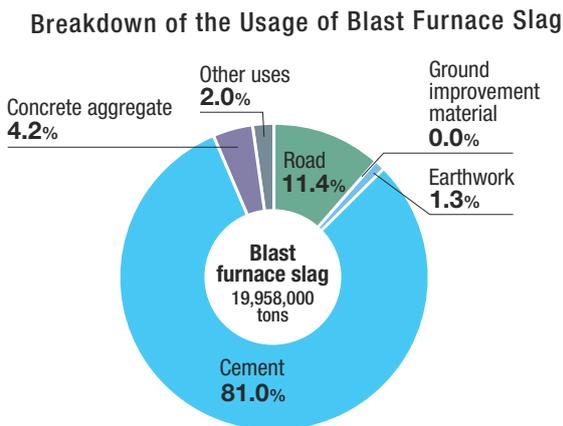
Trend in the Use of Blast Furnace Slag by Usage Breakdown



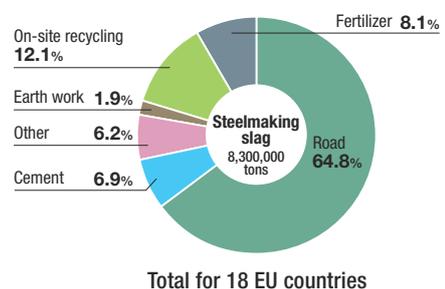
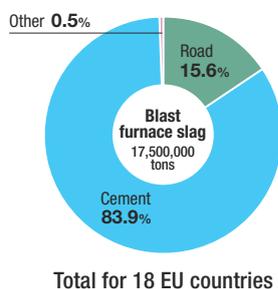
Trends in the Use of Steelmaking Slag by Usage Breakdown



Breakdown of the Usage of Blast Furnace Slag and Steelmaking Slag by Application (FY 2023)

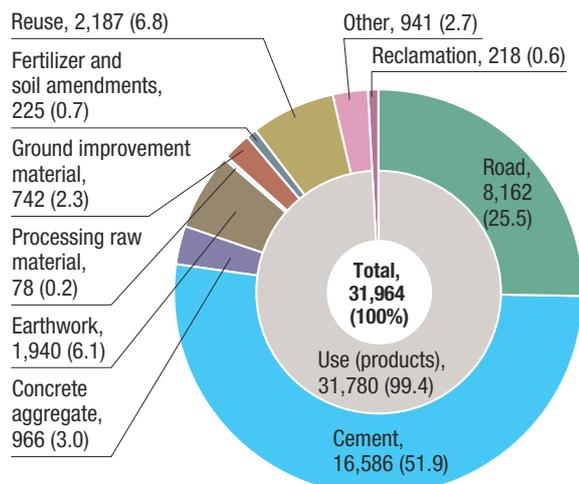


[Reference] Utilization of Blast Furnace Slag and Steelmaking Slag in Europe (2018)

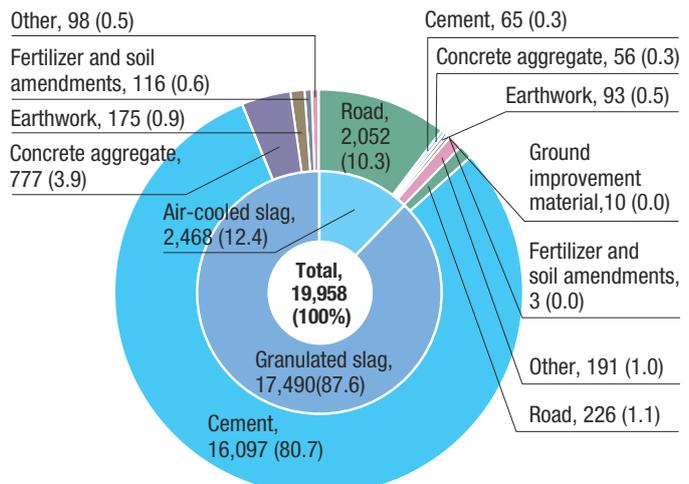


## Amount of Iron and Steel Slag Used by Application (Actual Results for FY 2023)

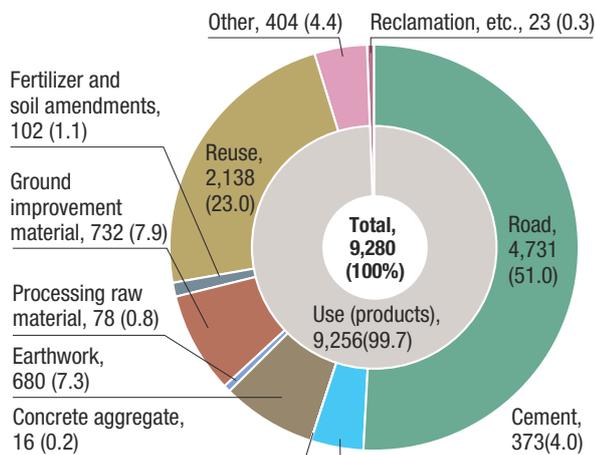
(Unit: 1,000 tons (%))



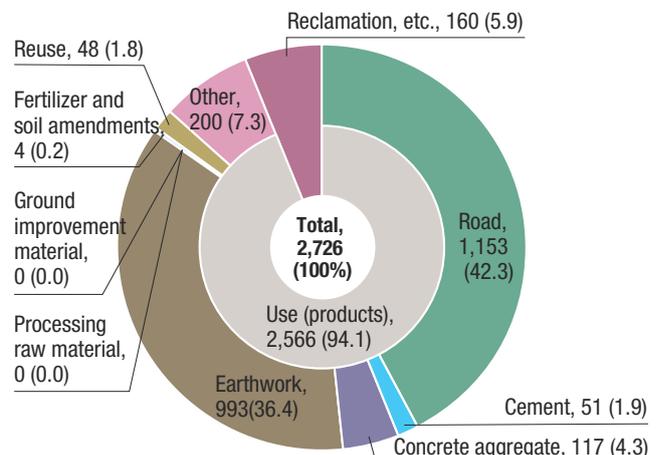
Total Amount Used by Application



Amount of Blast Furnace Slag Used by Application

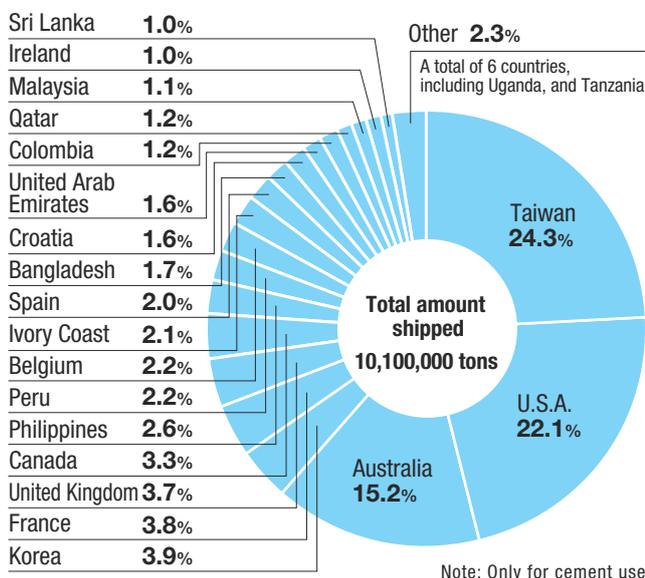


Amount of Converter Slag Used by Application



Amount of Electric Arc Furnace Slag Used by Application

## Breakdown of Export Destination of Blast Furnace Slag for Cement Use (FY 2023)



## Trend in Production and Reclamation Amounts of Iron and Steel Slag

